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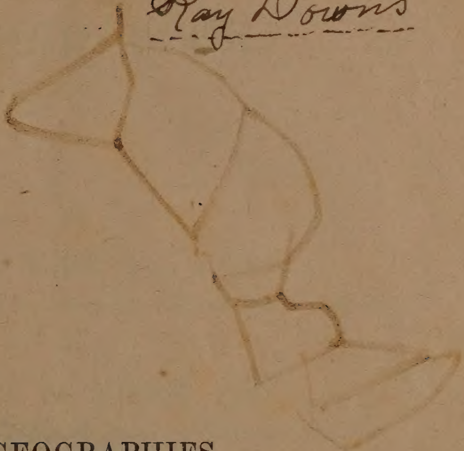

NEW GEOGRAPHIES

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NEW GEOGRAPHIES

SECOND BOOK

BY

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WITH MANY COLORED MAPS AND NUMEROUS ILLUSTRATIONS
CHIEFLY PHOTOGRAPHS OF ACTUAL SCENES

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PREFACE

Place of General Geography in this Volume. — The most difficult part of common school geography is that dealing with the motions of the earth, latitude and longitude, winds, rainfall, ocean currents, and temperature. Yet these subjects are almost universally placed at the beginning of the advanced book, so that their treatment follows immediately upon Primary Geography. This arrangement requires children to move abruptly from a meager study of the simplest facts in geography to its broadest abstractions, which is thoroughly bad and unnecessary.

In this volume only two chapters at the beginning of the book precede the intensive treatment of the United States. The first is a physiographic history of the continent, showing how its principal mountain ranges and valleys came into existence; how its coal beds were formed; what were the effects of the great Ice Age; and what have been the more recent changes in the coast line, with their results. Then comes a chapter on the Plants, Animals, and Peoples of North America; and the two chapters occupy only 26 pages. Whatever further facts in regard to winds, rainfall, temperature, etc., are needed in the study of North America have been plainly stated, when wanted, just as other concrete facts have been. After our continent is finished, and a fair number of concrete data, bearing on these matters, has been presented, these are treated as general topics in some detail. By this arrangement, the study of these difficult subjects has been postponed at least one year, and so many of the facts that are necessary to their appreciation have been presented concretely that they are then approached somewhat inductively. The authors regard this as one of the most important among the distinguishing features of this volume.

The general principles in regard to industries, distribution of inhabitants, mutual relation of city and country, and dependence of various sections upon one another, form another subject which, contrary to custom, is treated in the middle and latter parts of the volume. One reason for this is that these broad truths approach abstractions in their nature, and are, consequently, too difficult to be earlier appreciated by children. They are, moreover, to a large extent, a summary of what has preceded, and, therefore, naturally come last when a more inductive approach is possible.

Prominence of Review and Comparison. — A common defect in the teaching of geography is that pupils are allowed to forget about one country while studying the next; and the result is that, by the time Australia is reached, most of what has previously been learned about the United States, as well as other countries, has faded from memory. Yet the relation between North America and the other continents is so marked that this defect is quite unnecessary. For example, most of the industries and basal principles of physiography and climate have received the attention of a child when he has completed a general study of the United States. Foreign lands illustrate the same great ideas under different conditions. This means that the comprehension of foreign countries may best be gained by our children, if they use their previous knowledge of the United States as a basis of comparison. If, then, this old related knowledge is carefully called to mind when the physiography, climate, and industries of a foreign land are approached, our pupils will not only secure a fuller appreciation of that region, but will also keep their knowledge of the United States fresh by bringing it into use.

The above has been a controlling idea in preparing this volume. Accordingly in approaching the physiography of South America (p. 236), the physiography and climate of Europe (pp. 257, 264), etc., the authors have reproduced the corresponding situations in our own country at some length. Besides this, they have included in the text scores of brief comparisons with the United States. By this means incidental reviews are continually provided, which are especially attractive to both teachers and pupils.

To supplement this kind of review several sets of questions, which call for still different comparisons with the United States, are included in the book, one series being found at the close of the treatment of each continent. These are likewise rich in motive, inasmuch as they recall leading facts in regard to the United States from varying points of view. It should be kept in mind, also, that each set at the same time reviews another continent from a new point of view.

Many of the facts in regard to the United States which these questions call for are not directly presented in the text which treats of the various continents, and answers for a few of them are not indicated in the maps. Also pupils may have forgotten some of the important information about the United States. For these reasons Section VII, covering 17 pages, is an organized review of North America alone. It includes the principal facts about our continent which every pupil should know on completing the grades.

The title of the last section, "Review of the United States and Comparisons with Other Countries," indicates provision for still further review. It has seemed to the authors an anticlimax to close several years' study of geography with the *Islands of the Pacific*, lands farthest away from us and of least interest to us. On the other hand, it has been deemed highly important that, after all the countries of the world have been treated, the closing chapter should summarize the situation and show the rank of our own land and its relation to others. This secures a final reconsideration of the principal facts in our geography, while at the same time it brings them into proper relation and perspective.

On the whole, the authors are of the opinion that reviews should occupy a large part of the time of instruction;

and, by the plan followed, pupils will have a fairly complete knowledge of the United States and the rest of the world in their possession, not only when they finish the grades, but in years to follow.

Physiographic Basis and Causal Sequence. — The authors believe that rational geography must rest upon a physiographic foundation. Physiographic conditions most often furnish the reasons for the location of human industries, the development of transportation routes, the situation of cities, etc. In other words, when the physiographic facts about a given region are clearly grasped, most of the other geographic facts easily arrange themselves as links in a causal chain. Thus the many details touching a certain locality are taught in relation with one another, so that they approach the form of a narrative, rather than that of a mere list of statements.

Physiography has, therefore, been introduced freely; but under two limitations. First, only such physical facts are included as are shown really to function in man's relation to the earth. Physiography that is clearly shown to have a *real* bearing upon man greatly enriches geography; it is the *unused* physical geography that is a stumbling block. Second, these physical facts are presented in connection with their *use*, not entirely apart from it and in a different part of the book.

Abundance of Detail. — The interest of a geography text, as of any other text, must depend in large measure upon the amount of detail included. One characteristic of this volume is that it deals with its subject in unusual detail. Particularly in the treatment of many of the fundamental ideas of geography is this apparent. As was suggested in the Preface of the First Book, the basal units for the study of geography, although constantly in use, are seldom adequately presented in the text-books. This applies strikingly, for example, to such topics as farm, cattle ranch, irrigation, lumber camp, and factory. In order to remedy this defect, as far as possible, each subject of such a kind is presented in these books with as much detail as space permits, and in connection with that section of country in which it seems most prominent.

For example, lumbering, fishing, and the manufacture of cloth, boots, and shoes receive their most detailed treatment in connection with New England; the mining of coal and iron ore and the manufacture of iron goods are discussed in connection with the Middle Atlantic States; and gold mining, irrigation, and grazing are naturally included under the Western States.

The industries and objects thus described, being fairly typical of industries and objects found elsewhere, are on that account worthy of being called *types*. Through the careful presentation of such types, vivid pictures and an appreciation on the part of the pupils are assured.

The study of the United States has, as suggested above, furnished occasion for detailed treatment of most geographic types. Some important features and occupations, however, are not found in the United States, but to these the authors have endeavored to give the same careful consideration. For instance, so far as space permits, the Brazilian forest is presented as a type of tropical forests (page 243). Other illustrations may be found in the treatment of the linen industry on page 270, and of the silk industry on page 286. The object is to continue to acquaint the learner properly with the basal units of geography, as well as to make geography interesting.

Organization of Subject-matter. — In advanced geography, perhaps even more than in the primary book, there is a tendency to offer subject-matter in the form of disconnected facts. The greater amount of detail in the more advanced volume no doubt makes it especially difficult to avoid such looseness of organization. The most flagrant example of this evil is the treatment of the United States by individual states, which we have discarded. To be sure, there is a call for a knowledge of our own country by states, and an endeavor has been made to meet it by several sets of questions which require a careful state review. But when the geography of the United States is presented *primarily* by states, the child is oppressed and confused by the great number of individual facts which have apparently the same rank. Even an adult cannot easily escape a feeling of confusion on reading a few pages from a geography that divides the subject into such small units.

Where this particular defect is avoided, it is often difficult to distinguish the principal from the subordinate facts and to carry the outline of the whole easily in mind. The remedy must be found first, in the treatment of each country or other large subject under only a few headings; and second, in bringing together all details that bear upon a particular topic, and excluding all else. Thus, in the treatment of the Western States in this volume, farming by irrigation is only once extensively treated. A whole page is devoted to a discussion of the subject, including the manner in which irrigation is planned in the vicinity of Denver, its cost, and its influence on the value of land. These many details are associated as parts of one story; and as there are only a few such topics in the entire chapter on the Western States, it is not difficult to keep in mind the leading points. The use of the type idea elsewhere accomplishes the same purpose.

The frequent comparisons provided for at the close of the chapters likewise do much to preserve perspective, for they lift the more important thoughts into prominence while neglecting non-essentials. Similarly the two review chapters, one a Review and Comparison of our states, the other a Comparison of the United States with other countries, distinguish in a prominent way the leading from the minor facts. But, above all, throughout this volume the subject-matter in each chapter is presented under so few headings that the learner is likely to be impressed with the simplicity of the situation. The authors, at least, cherish the hope that the pupil will see the outline clearly even in the midst of the necessary mass of details.

Probably the most important improvement of this volume over the former Tarr and McMurry "Advanced Geography" consists in its better organization. The marginal headings have been selected with great care; also a large amount of energy has been consumed in bringing into one place all the details that bear on a single question, and in rigidly excluding all irrelevant matter from among them.

Extent of Changes in this Revision. — In bringing the facts in this volume down to date, and in reorganizing them in the manner above indicated, approximately one half of the entire text has been rewritten, while much of the remainder has been modified to some extent. These changes, together with entirely new maps and many new illustrations, make the book a radical improvement over the original volume, while preserving any peculiar merits that that book may have possessed.

The increased quantity of subject-matter made it necessary either to widen the old style page — of one column — or to adopt a new form. Since the length of line in the former case would have been quite unjustifiable, it seemed best to follow the latter plan.

Maps, Illustrations, and Acknowledgments. — The maps for this volume have been entirely remade and their number increased. A feature of especial note is the introduction of a series of colored physical maps, so that each continent is represented by three maps — a political map, a relief map, and a physical map.

Many of the drawings of the old book, notably those made by Mr. C. W. Furlong, the well-known artist, are used again in this volume; we have also made use of some of the better half-tones in the old book. Many new illustrations are introduced, however, but in no case merely for the sake of having something new; change has been made only when distinct improvement has been possible. The half-tones and other illustrations are introduced not merely as pictures, but as part of the fund of information offered; and it is expected that they will be studied in connection with the text which they illustrate, amplify, or explain.

We are indebted to Mr. Philip Emerson of the Cobbett School, Lynn, Massachusetts, and to Professor R. H. Whitbeck of the University of Wisconsin, for assistance in the preparation of the original volume as acknowledged in its preface, and Professor Whitbeck has given further aid in this revision, especially in the selection of illustrations. Valuable assistance in preparation of statistics and lists of books of reference has been rendered by Mr. Irvine Perrine and Miss Kathryn Kyser of Cornell University. Naturally we are indebted to many sources for the material making up the text in this volume, but among them Mills' "International Geography," "The Statesman's Year Book," The United States Census Report, and Ratzel's "History of Mankind" call for special mention.

As for illustrations, aside from those made by Mr. Furlong, already acknowledged, we are especially indebted to William Rau of Philadelphia, from whose extensive collection of photographs we have selected a large proportion of the photographs from which our half-tones are made. To other photographers whose pictures we have used — a list far too large to incorporate here — and to other sources acknowledged in the preface of the "Complete Geography" we are also indebted. Special mention should be made of the assistance rendered by the Philadelphia Commercial Museum in supplying us with a series of world product maps, and in giving us permission to reproduce some of their photographs. The relief maps were made by E. E. Howell of Washington.

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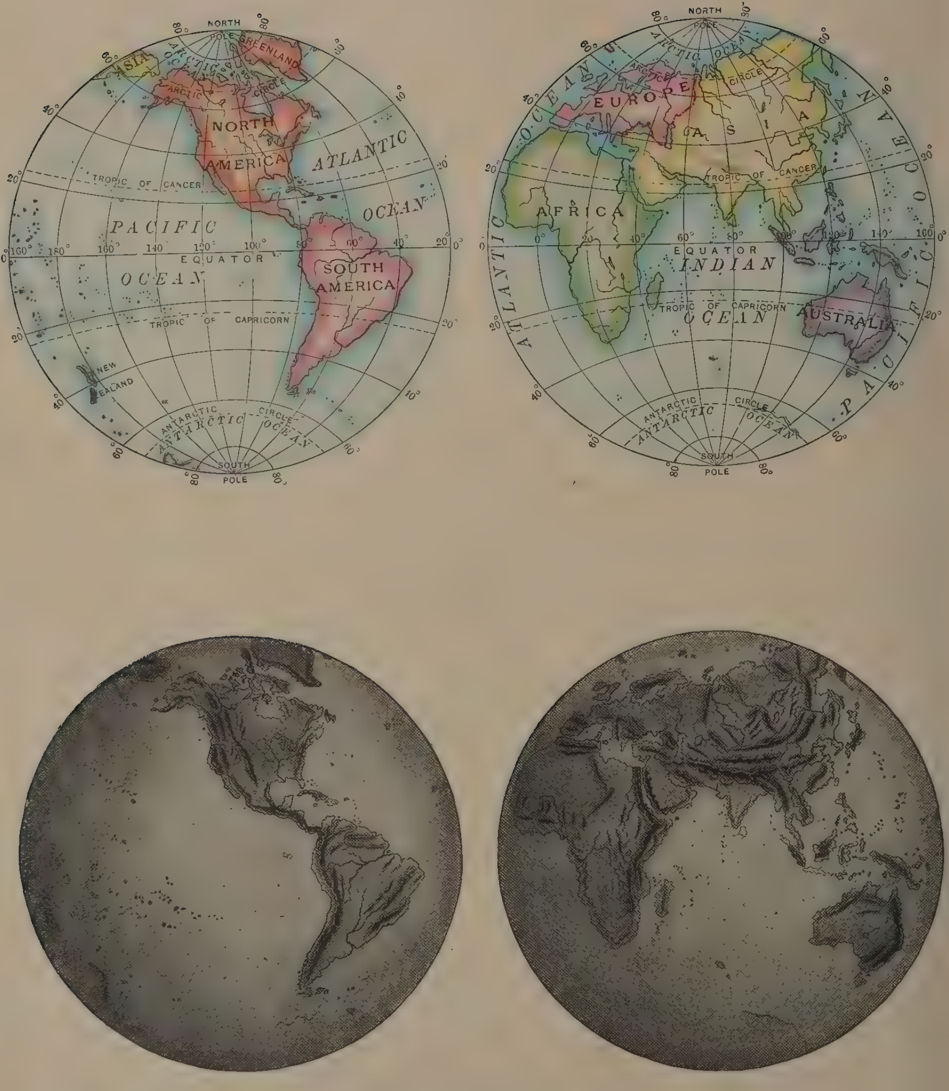


FIG. 1.

The Eastern and Western Hemispheres.

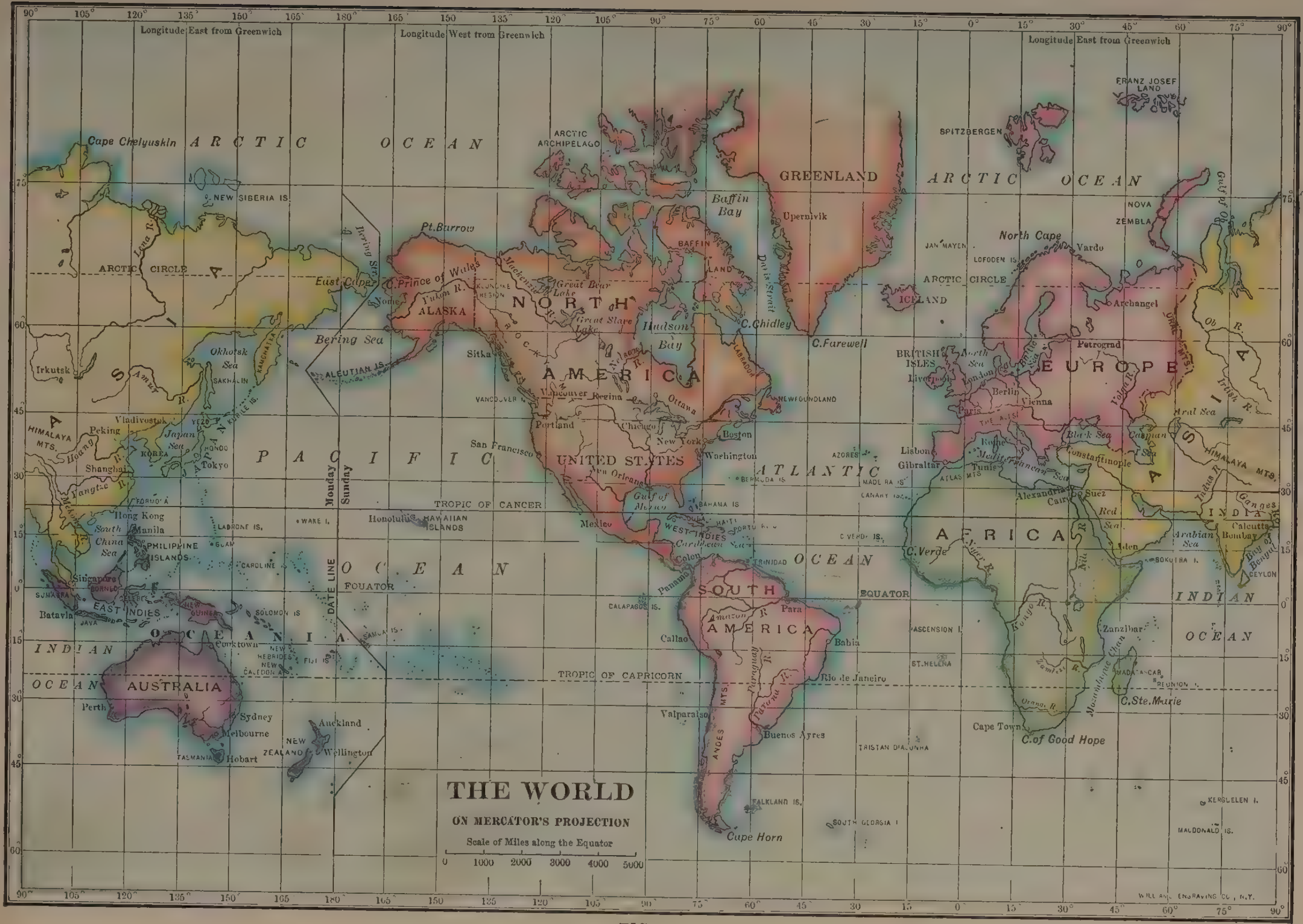

THE WORLD
ON MERCATOR'S PROJECTION
Scale of Miles along the Equator
0 1000 2000 3000 4000 5000
Longitude East from Greenwich
Longitude West from Greenwich
Longitude East from Greenwich
ARCTIC OCEAN
PACIFIC OCEAN
ATLANTIC OCEAN
INDIAN OCEAN
NORTH AMERICA
SOUTH AMERICA
EUROPE
ASIA
AFRICA
AUSTRALIA
OCEANIA
GREENLAND
UNITED STATES
ALASKA
ARCTIC CIRCLE
TROPIC OF CANCER
EQUATOR
TROPIC OF CAPRICORN
DATE LINE
Monday
Sunday
Cape Chelyuskin
NEW SIBERIA IS.
ARCTIC ARCHIPELAGO
SPITZBERGEN
FRANZ JOSEF LAND
NOVA ZEMBLA
Gulf of Ob
ICELAND
BRITISH ISLES
Hudson Bay
Baffin Bay
Davis Strait
Bering Sea
Bering Str.
ALEUTIAN IS.
Pt. Barrow
C. Farewell
C. Chidley
C. Horn
C. of Good Hope
Cape Town
Irkutsk
Peking
Shanghai
Tokyo
Vladivostok
Hong Kong
Manila
PHILIPPINE ISLANDS
EAST INDIES
Singapore
Batavia
Perth
Sydney
Melbourne
Hobart
NEW ZEALAND
Auckland
Wellington
HAWAIIAN ISLANDS
Honolulu
San Francisco
Vancouver
Portland
Chicago
New York
Boston
Washington
New Orleans
Mexico
Panama
Callao
Valparaiso
Buenos Ayres
Rio de Janeiro
Bahia
Para
London
Paris
Berlin
Vienna
Rome
Petrograd
Archangel
Constantinople
Alexandria
Cairo
Suez
Aden
Bombay
Calcutta
Zanzibar
Lisbon
Gibraltar
WILL AND ENGRAVING CO., N.Y.

FIG. 2.

PART I. NORTH AMERICA

I. The Story of our Continent

Our continent not always as it now is

There are a hundred and twenty-five million persons in North America at the present time, although a century ago there were scarcely one tenth of that number. This wonderful growth has been largely due to the valuable mineral products of the earth; to the soil and climate, which have allowed the forests and the many different kinds of plants and animals to thrive; and to the rivers, waterfalls, lakes, and harbors, which have made manufacturing and shipping easy.

Yet these valuable things were not always here, as we now find them. Each has had a long history. For, as it takes time to build a house, and to prepare the boards from trees, the nails from iron ore, and the bricks from clay, so it takes time for the formation of minerals and rocks, and for the building of a continent. In fact, millions of years have been required for all that work.

Where the story of its growth has been learned

The story of the growth of North America has been learned by a careful study of the rocks; and, although many questions may be asked that no man is yet able to answer, we are prepared to tell a part of that story.

Its birth

At one time the earth was probably a white-hot sphere, like the sun, but in time the outside cooled to a crust of solid rock. The interior, still heated, continued to shrink and grow smaller, as most substances do when cooling. This caused the solid crust to settle and wrinkle, much as the skin of an apple wrinkles when the fruit is drying. Water collected in the lower portions, making the oceans, while the higher portions formed dry land. Thus North America and the other continents were born.

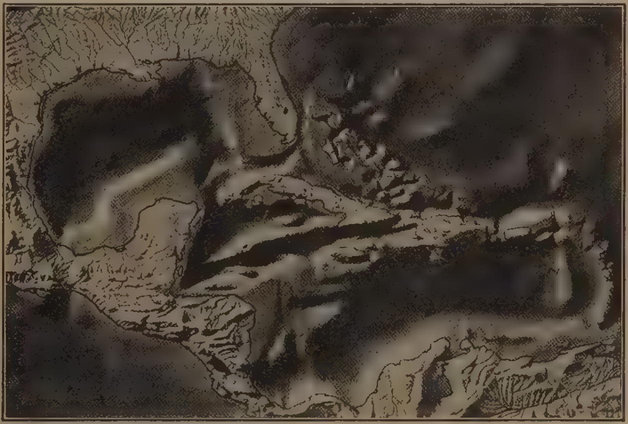


Fig. 3.—A part of the relief map of North America showing the West Indian chain of mountains rising from the bed of the sea.

Its early history

In its early history the central part of the continent was still a broad sea, but the eastern and western parts doubtless resembled the West Indies of to-day, which you will find on the map of North America (Fig. 10). Those islands are the highest parts of a great mountain chain. They *seem* to be separated merely because the ridges upon which they rest do not extend above the water (Fig. 3).

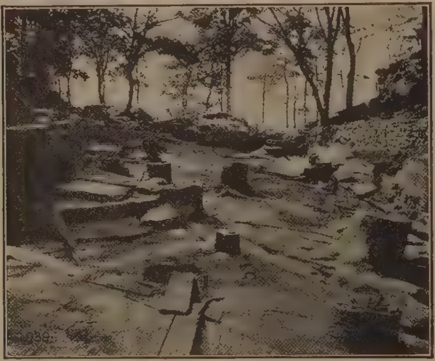


Fig. 4.—Trunks of trees, in the solid rock, standing where they grew when these rocks were being deposited as sediment in the Coal Period.

Its later life

Although in early times North America consisted of mountain crests that formed chains of islands, many changes followed. In the course of ages, the mountains rose higher, forming a continuous range in the East, and several ranges in the West. Then the plains between the mountains were slowly raised above the ocean, and a large part of the continent came into view.

The Coal Period

Ages after the beginning, a period arrived when the climate was much warmer in the northern part of North America than now, and the rains were far heavier. During that period our *coal* was formed out of the remains of plants.

1. What coal is made of, with proof

There is a good proof that the coal used in our stoves and furnaces is made of plant remains. Roots of plants may still be seen in the old soil, now changed to rock, that lies beneath the coal beds; and stems of plants, and even trunks of trees (Fig. 4) changed to coal, are found in the coal beds. Besides, with a microscope, or at times even with the naked eye, one can see that coal is made of bits of plants pressed closely together. Sometimes the full form of a fern or leaf, called a *fossil*, may be seen (Fig. 5).

2. How coal beds were formed

As the crust of the earth slowly shrank and wrinkled, the land was raised and lowered. Even now it is slowly moving in some places, and it was doing the same during the Coal Period. At that time parts of the old sea bottom were raised above the water, forming extensive plains in the eastern part of North America. Those plains were so low and level that vast swamps were produced (Fig. 6), on which a rank vegetation grew, as in a tropical jungle.

The swamps were, no doubt, somewhat like those which may now be seen in many parts of the earth. Possibly the vegetation grew far more thickly than now, perhaps even more thickly than it now grows in the forests of the Amazon or the everglades of Florida. The plants of the Coal Period were different from those of the present (Fig. 7); indeed, none of the many kinds of trees that we now know grew in those ancient forests.

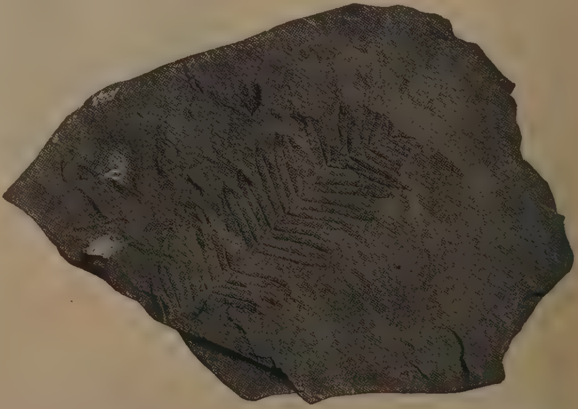


Fig. 5.—The print of a fern in a rock that was formed during the Coal Period.

After the plants had grown in those swamps for hundreds of years, the plains sank beneath the sea, and layers of mud, sand, and gravel collected over them. These have since been hardened into layers of rock, and the vegetation beneath them has been changed into coal. After another long period the sea bottom was raised once more, and dense swamp vegetation again grew; but these plants had their roots in the ocean mud that had buried the earlier swamp. After many more years the plains again sank, and the swamp vegetation was covered over, as before. This rising and sinking of the land continued for ages, one set of layers of mud, sand, gravel, and vegetation being covered up by another, until many such sets were formed, producing many beds of coal.

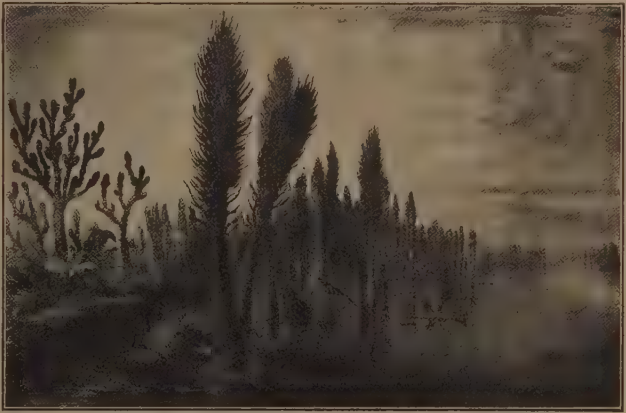


Fig. 6.—A view showing how the forests of the Coal Period probably looked.

The vegetation gathered in some of the swamps to a depth of many feet; but, when this was covered by the layers of mud, sand, and gravel, it was pressed more tightly together. As the number of these layers increased, the pressure became very great, and thus the vegetable matter was pressed so closely together that it made beds of coal. These are usually only two or three feet thick, but some are as much as ten or fifteen feet in thickness.

Fig. 7.—Trees of the present day in a swamp in Arkansas. Notice how very different these trees are from those in the swamp of the Coal Period (Fig. 6).

3. The different kinds of coal

When the plants died, they fell into the water, making a woody matting which did not fully decay, because the water prevented air from reaching it. If it could then have been dug up and dried, it would have made good fuel. Indeed, in Ireland, Norway, and other cool, moist lands, it is now the custom to dig such woody matter out of the swamps and dry it for burning (Fig. 8). Such fuel, called *peat*, is much used for cooking and heating. Some of the poorer coals, known as *lignite*, are little more than peat beds partly changed to mineral coal.

Other beds, having far more pressure upon them, have been changed to harder coal. One kind of coal, called *anthracite*, found in the mountains of Pennsylvania, has been so greatly changed that it is as hard as some rocks, and is known as *hard coal*. But most of the coal, like that of western Pennsylvania and the Central States, — although a real mineral, and harder than lignite, — is not so hard as anthracite. This is called *soft*, or *bituminous*, coal.

All this time, and at other periods during the formation of the continent, iron, copper,

The deposit of other minerals

gold, silver, building stones, and other mineral substances that we use every day, were also slowly being made. Many of them, such as gold, silver, and copper ores, were deposited in cracks in the mountain rock. They were brought and left there by hot water, forming what are called *mineral veins*. Iron ore also has been deposited in beds and veins, though not always by hot water.

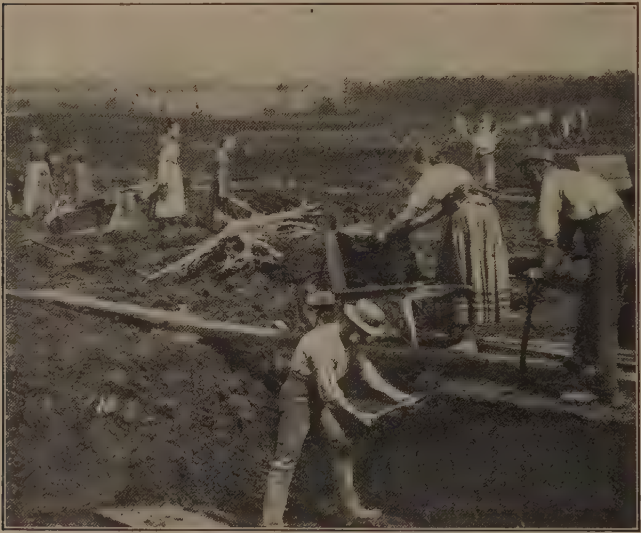


Fig. 8.—A scene in Ireland, showing the digging of peat from the bogs. It comes out of the bog wet, and is then wheeled away and spread out in the sun to dry.

Other great changes

1. Formation of mountains and plateaus

(1) Appalachian Mountains and surrounding plateaus

During the millions of years that the continent was slowly growing, mountain systems and plateaus were forming in both the East and the West. These were caused by the shrinking and wrinkling of the earth's crust. They were to have a great influence upon our climate, and therefore upon our crops, our animals, and ourselves.

The eastern mountains, called the Appalachians (Fig. 10), were raised above the sea in early ages. Since then they have been slowly worn away by weather and water, and thus lowered so that they are now neither very high nor very rugged. Still, they have some peaks which reach more than a mile above sea level.

It should be understood, however, that it is not a mile from the base to the summit of such mountains; for mountains usually rest upon a platform, or table-land. The table-land, or plateau, upon which the Appalachians rest, for instance, is over a quarter of a mile above sea level. When we say that the mountains are a mile high, therefore, we mean that their summit is a mile above the level of the ocean, which may be many miles from the mountain base.

(2) The Cordillera and surrounding plateaus

The western mountains, or *Cordillera*, are younger and therefore less worn down than the Appalachians. For this reason they are much more rugged, with many deep canyons and lofty peaks, some of which rise three miles and more above sea level. This includes the broad plateau at their base, which itself is more than a mile in height, or as high as the mountain peaks of the East. Some of these mountains are still growing, and now and then an earthquake is caused as the mountain rocks snap and move under the great strain.

(3) Volcanoes

While the Appalachians and Cordillera have been caused by the shrinking and wrinkling of the earth's crust, hundreds of mountain peaks in the West have been formed in a different way. They are called *volcanoes*, and are built of molten rock, or *lava*, that has been forced to the surface from within the earth. Though no longer active, these peaks are known to be volcanoes because of their cone shape; the hollows, or *craters*, in their tops; and the lava and *volcanic ash*, or blown-up lava, of which they are made.

Hundreds of thousands of square miles of the western part of the United States are covered by lava. Much of the soil produced by the decay of the lava is very fertile, and that is one of the chief reasons why the central and eastern part of the state of

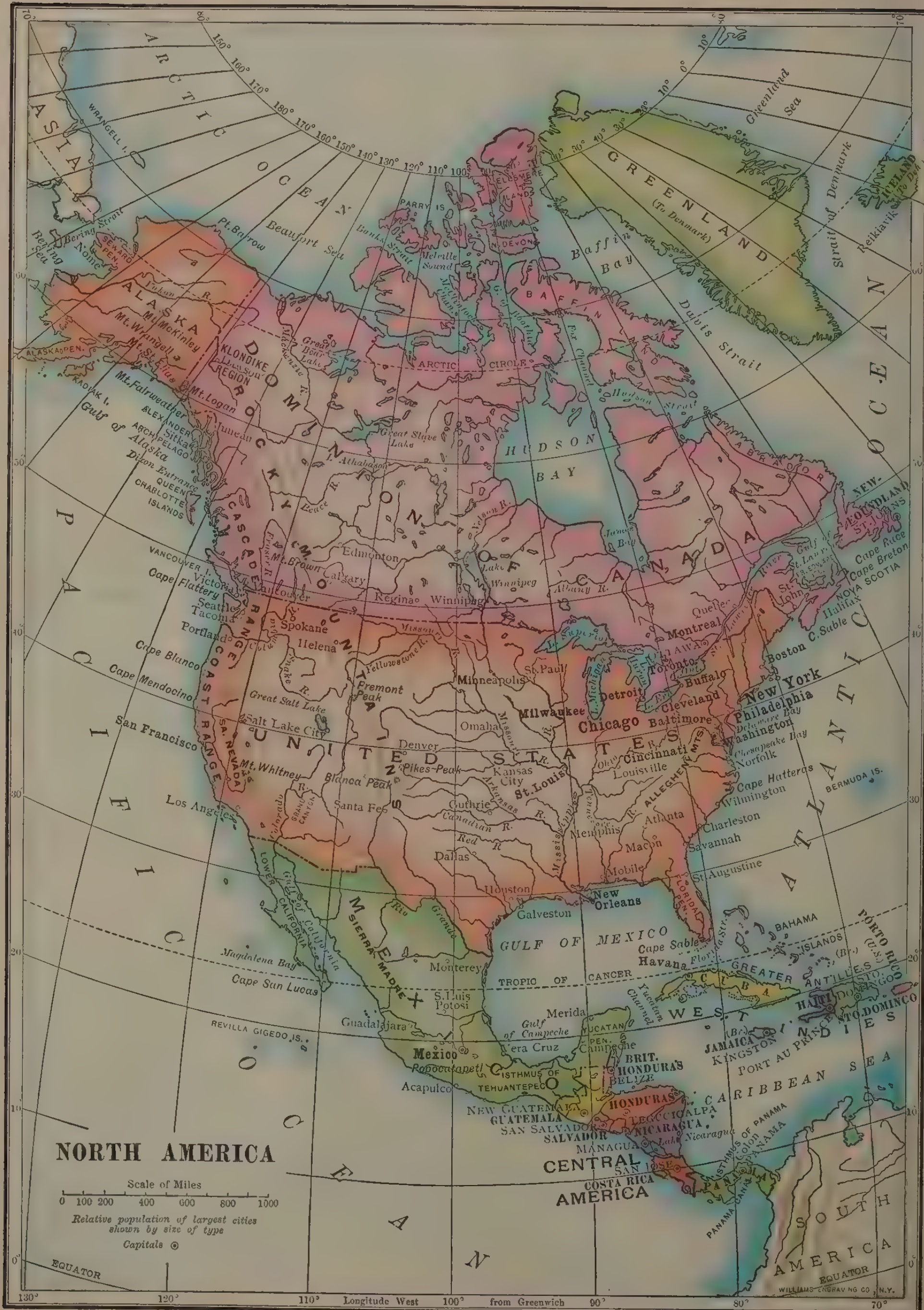

NORTH AMERICA
Scale of Miles
0 100 200 400 600 800 1000
Relative population of largest cities shown by size of type
Capitals ⊙
ARCTIC OCEAN
ASIA
WRANGELL I.
Bering Strait
Bering Sea
Nome
SEWARD PEN.
Pt. Barrow
Beaufort Sea
ALASKA
Yukon R.
Mt. McKinley
Mt. Wrangell
Mt. St. Elias
Mt. Logan
Mt. Fairweather
ALASKA PEN.
KADIAK I.
Gulf of Alaska
ALEXANDER ARCHIPELAGO
Sitka
Juneau
Dixon Entrance
QUEEN CHARLOTTE ISLANDS
KLONDIKE REGION
DOMINION OF CANADA
ROCKY MOUNTAINS
PARRY IS.
Banks Strait
Melville Sound
ELLESMERE LAND
N. DEVON
BAFFIN LAND
Great Bear Lake
Mackenzie R.
ARCTIC CIRCLE
Great Slave Lake
L. Athabasca
Peace R.
Edmonton
Calgary
Mt. Brown
Regina
Winnipeg
Lake Winnipeg
Nelson R.
HUDSON BAY
James Bay
Albany R.
Hudson Strait
Fox Channel
LABRADOR
CANADA
NEWFOUNDLAND
ST. JOHNS
Cape Race
Cape Breton
NOVA SCOTIA
Halifax
C. Sable
St. John
Gulf of St. Lawrence
Quebec
Montreal
OTTAWA
Toronto
Buffalo
GREENLAND (To Denmark)
Greenland Sea
Baffin Bay
Davis Strait
Strait of Denmark
ICELAND (To Den.)
Reikiavik
ATLANTIC OCEAN
PACIFIC OCEAN
VANCOUVER I.
Victoria
Vancouver
Cape Flattery
Seattle
Tacoma
Portland
Cape Blanco
Cape Mendocino
San Francisco
Los Angeles
CASCADE RANGE
COAST RANGE
SIERRA NEVADA
Mt. Whitney
Spokane
Helena
Snake R.
Columbia R.
Yellowstone R.
Missouri R.
Fremont Peak
Great Salt Lake
Salt Lake City
Denver
Pikes Peak
Blanca Peak
Santa Fe
Colorado R.
GRAND CANYON
UNITED STATES
Minneapolis
St. Paul
L. Superior
L. Michigan
L. Huron
L. Erie
L. Ont.
Milwaukee
Chicago
Detroit
Cleveland
Omaha
Kansas City
St. Louis
Arkansas R.
Canadian R.
Red R.
Guthrie
Dallas
Houston
Galveston
Mississippi R.
Ohio R.
Tenn. R.
Cincinnati
Louisville
Memphis
Atlanta
Macon
Mobile
New Orleans
ALLEGHENY MTS.
Boston
New York
Philadelphia
Delaware Bay
Baltimore
Washington
Chesapeake Bay
Norfolk
Cape Hatteras
Wilmington
Charleston
Savannah
St. Augustine
FLORIDA PEN.
BERMUDA IS.
BAHAMA ISLANDS (Br.)
Florida Str.
Cape Sable
GULF OF MEXICO
TROPIC OF CANCER
Havana
CUBA
GREATER ANTILLES
PORTO RICO (U.S.)
HAITI
SANTO DOMINGO
PORT AU PRINCE
JAMAICA (Br.)
KINGSTON
WEST INDIES
CARIBBEAN SEA
Yucatan Channel
YUCATAN PEN.
Merida
Campeche
Gulf of Campeche
Vera Cruz
BRIT. HONDURAS
BELIZE
HONDURAS
TEGUCIGALPA
NICARAGUA
Lake Nicaragua
MANAGUA
SAN SALVADOR
SALVADOR
NEW GUATEMALA
GUATEMALA
SAN JOSE
COSTA RICA
CENTRAL AMERICA
PANAMA
Colon
ISTHMUS OF PANAMA
PANAMA CANAL
GULF OF PANAMA
SOUTH AMERICA
EQUATOR
MEXICO
Mexico
Popocatapetl
Acapulco
ISTHMUS OF TEHUANTEPEC
Guadalajara
S. Luis Potosi
Monterey
Rio Grande
SIERRA MADRE
LOWER CALIFORNIA
Gulf of California
Magdalena Bay
Cape San Lucas
REVILLA GIGEDO IS.
Longitude West from Greenwich
130° 120° 110° 100° 90° 80° 70°
WILLIAMS ENGRAVING CO. N.Y.

FIG. 9.

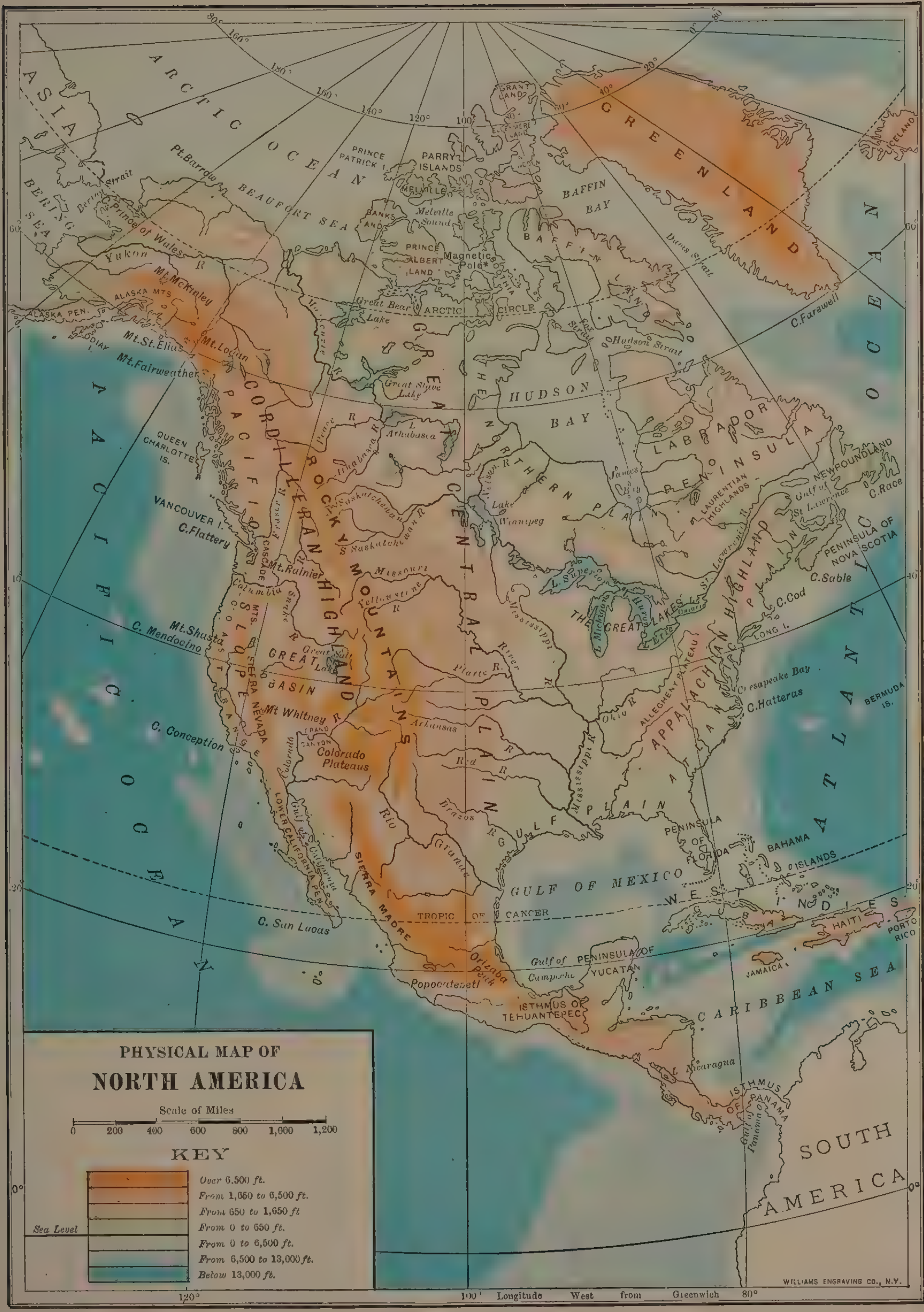

PHYSICAL MAP OF
NORTH AMERICA
Scale of Miles
0 200 400 600 800 1,000 1,200
KEY
Over 6,500 ft.
From 1,650 to 6,500 ft.
From 650 to 1,650 ft.
From 0 to 650 ft.
Sea Level
From 0 to 6,500 ft.
From 6,500 to 13,000 ft.
Below 13,000 ft.
ARCTIC OCEAN
ASIA
BERING SEA
Bering Strait
C. Prince of Wales
Pt. Barrow
BEAUFORT SEA
PRINCE PATRICK I.
PARRY ISLANDS
MELVILLE
Melville Sound
BANKS LAND
PRINCE ALBERT LAND
Magnetic Pole
GRANT LAND
GREENLAND
ICELAND
BAFFIN BAY
BAFFIN LAND
Davis Strait
C. Farewell
Hudson Strait
HUDSON BAY
James Bay
LABRADOR PENINSULA
LAURENTIAN HIGHLANDS
NEWFOUNDLAND
Gulf of St. Lawrence
C. Race
PENINSULA OF NOVA SCOTIA
C. Sable
C. Cod
LONG I.
Chesapeake Bay
C. Hatteras
BERMUDA IS.
ATLANTIC OCEAN
Yukon R.
ALASKA MTS.
ALASKA PEN.
KODIAK
Mt. McKinley
Mt. St. Elias
Mt. Logan
Mt. Fairweather
Mackenzie R.
Great Bear Lake
ARCTIC CIRCLE
Great Slave Lake
L. Athabasca
Peace R.
Athabasca R.
Saskatchewan R.
S. Saskatchewan R.
Nelson R.
Lake Winnipeg
GREAT CENTRAL PLAIN
NORTHERN PLAIN
QUEEN CHARLOTTE IS.
VANCOUVER I.
C. Flattery
PACIFIC SLOPE
CORDILLERAN HIGHLAND
ROCKY MOUNTAINS
CASCADE MTS.
Mt. Rainier
Fraser R.
Columbia R.
Snake R.
Missouri R.
Yellowstone R.
Mt. Shasta
C. Mendocino
COAST RANGE
SIERRA NEVADA
Great Salt Lake
GREAT BASIN
Mt. Whitney
GRAND CANYON
Colorado R.
Colorado Plateaus
Platte R.
Arkansas R.
Red R.
Brazos R.
Rio Grande
C. Conception
PACIFIC OCEAN
LOWER CALIFORNIA PEN.
Gulf of California
SIERRA MADRE
TROPIC OF CANCER
C. San Lucas
Orizaba Peak
Popocatepetl
L. Superior
L. Michigan
L. Huron
L. Erie
L. Ontario
THE GREAT LAKES
St. Lawrence R.
Mississippi River
Ohio R.
ALLEGHENY PLATEAU
APPALACHIAN HIGHLAND
ATLANTIC PLAIN
GULF PLAIN
PENINSULA OF FLORIDA
BAHAMA ISLANDS
GULF OF MEXICO
WEST INDIES
HAITI
PORTO RICO
JAMAICA
Gulf of Campeche
PENINSULA OF YUCATAN
ISTHMUS OF TEHUANTEPEC
CARIBBEAN SEA
L. Nicaragua
ISTHMUS OF PANAMA
Gulf of Panama
SOUTH AMERICA
Longitude West from Greenwich
WILLIAMS ENGRAVING CO., N.Y.

FIG. 10.

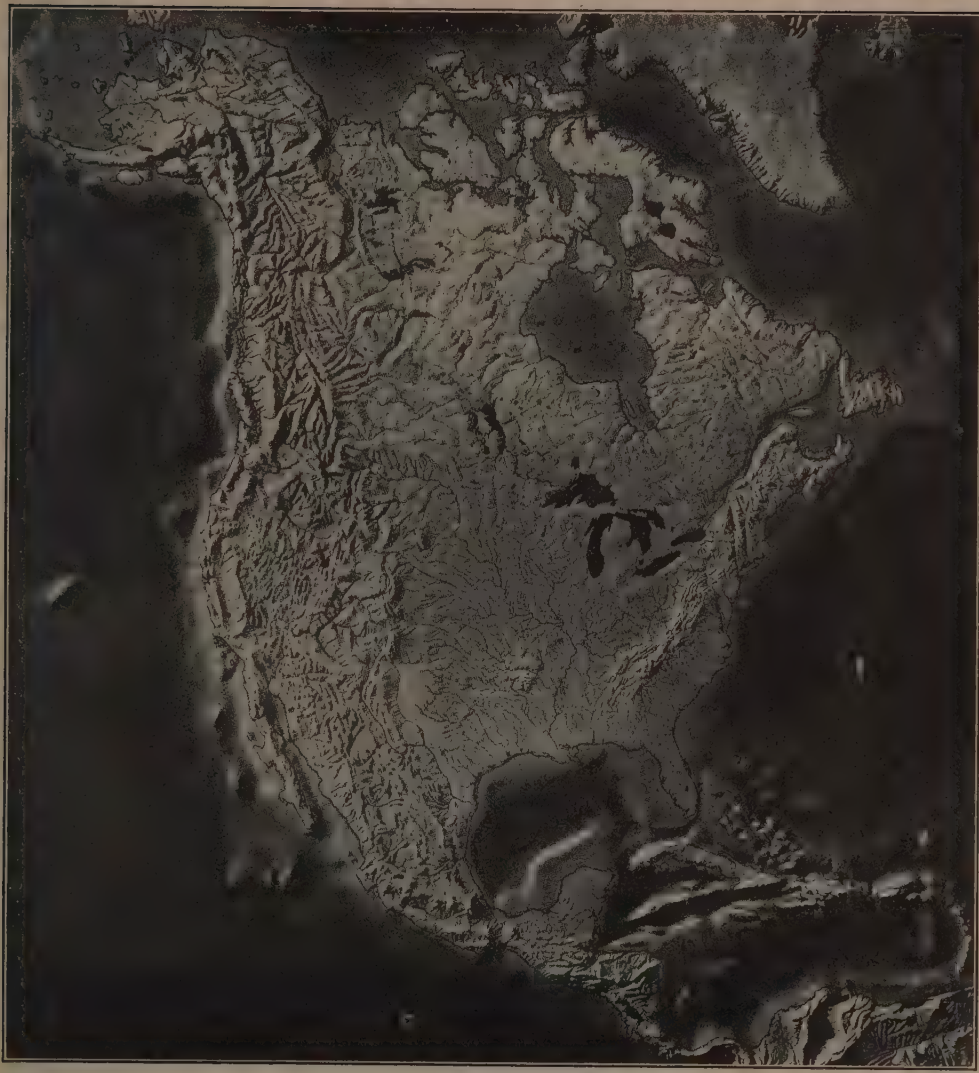


FIG. 11. — Relief map of North America.

Washington, which is largely covered with such a soil, has become noted for wheat.

2. Formation of the trough between the Appalachians and the Cordillera

From the mountain systems of the East and West, the land slopes gently toward the Mississippi River (Fig. 14). These slopes form a kind of trough, through the lowest part of which this river flows. It was by the uplift of the mountains on its two sides that this broad trough was formed. Measure its width on the map of the United States (Fig. 41).

Like the mountains, this extensive lowland, called the *plains of the Mississippi*

(1) *Its earlier history*

Valley (Fig. 15), has had a long history. In the early ages so much of it was under water that a sea extended from what is now the Gulf of Mexico, all the way to the Arctic Ocean. In the rock layers that lie beneath the soil of the lowland are found many remains, or *fossils* (Fig. 16), of shells, corals, and fish that lived in this ancient sea. Upon dying and dropping to the bottom, these animals were buried in the beds of sand, clay, and gravel that have since been hardened into rock.

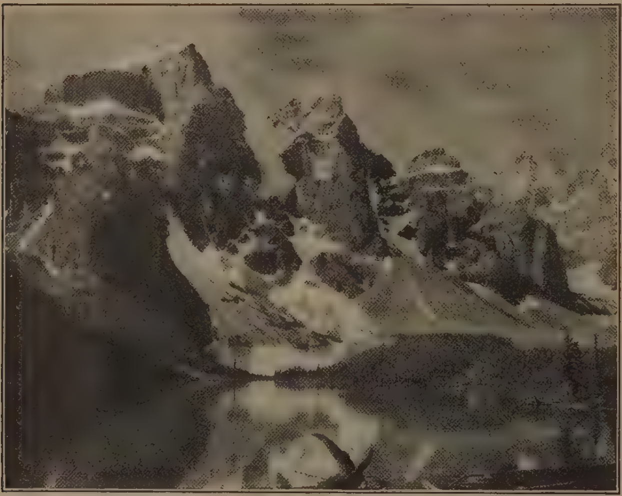


Fig. 12. — A view in the Western Cordillera showing the rugged mountains of that region.

(2) *How it reached its present form*

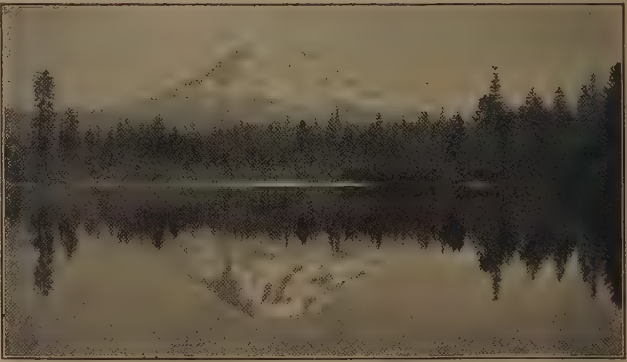
After a time most of this ancient sea bottom was raised to form dry land, although a part of it — from the Gulf of Mexico to the southern part of Illinois — remained under water for a long time afterward. Into this sea the Mississippi discharged its floods, and dropped its load of sediment, swept from the plains and distant mountains. As time went on, the river sediment entirely filled up this sea, and formed deltas and flood plains which — raised by a slight uplift — are among the most fertile lands of our country. And now the river seems bent on filling up the Gulf of Mexico itself. Already it has built its delta far out into the Gulf, as you can see.

The great importance of this arrangement of mountains and lowlands

One might not at first think that it made much difference how the mountains and lowlands happened to be placed during the formation of our continent; but it is, in fact, a matter of the greatest importance.

The Mississippi Valley has become the home of many millions of people; and the climate in which they live, together with the crops that they raise, depend in large part on the direction and height of the mountain systems.

The Cordilleran Highland, for instance, has a great influence on the rainfall in this valley. In all but the southern part of the Mississippi Valley, the winds blow much more often from the west than from any other



Copyright, 1906, by A. H. Barnes.

Fig. 13. — Mount Rainier, in Washington, one of the volcanic cones of the West.

direction. Coming from the Pacific Ocean, well laden with moisture, these winds are forced to drop more and more of it as they pass over one lofty mountain range after another. When they finally descend east of the Rocky Mountains, therefore, they have little dampness left. This leaves the plains and plateaus of the Northwest dry, or *arid*.

The Appalachians, being much lower, allow winds to carry more moisture over them. Since there are no mountains on the south, winds from that direction can bring in vapor freely. Winds do, now and then, blow from the Atlantic and from the Gulf of Mexico, and for that reason the eastern, central, and southern portions of the great valley are well watered.

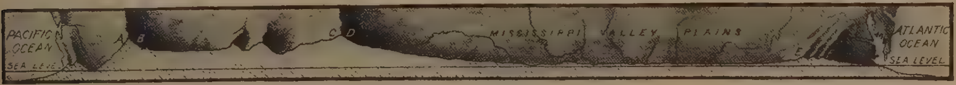


Fig. 14. — A section across the central part of the United States to show the relief and the principal slopes.

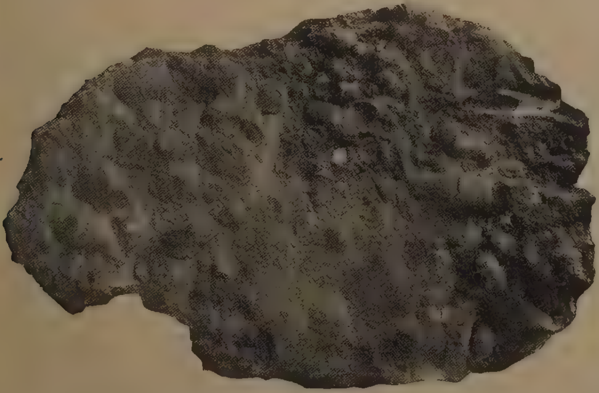


Fig. 16. — Shells or fossils in the rock that was deposited in the ancient sea that once covered central United States.

How different the climate would be if a lofty system of mountains extended east and west across the Mississippi Valley! Then the warm south winds could not carry their warmth and moisture so far north. Neither could the cold north winds reach so far south. Perhaps you can tell some of the changes that would follow if there were such mountains.

Fig. 15. — A wheat farm on the level plain of central United States.

The Great Ice Age

1. The vast sheet of ice, or glacier

Long after the coal beds were formed, and the great highlands and valleys were made, there came another very important event in the preparation of this continent for our home. It became far colder than it now is, just as during the Coal Period the climate was much warmer. Indeed, it became so cold that a sheet of ice, or *glacier*, was formed, so great that it covered a large part of northern North America. No one is able to say why it came, or why it went away; but all who have studied the subject are certain that it was here, and that it remained even thousands of years before melting away.

2. A similar glacier now in Greenland

An ice sheet similar to that ancient one may still be seen in Greenland (Fig. 17). Except along the very coast, the immense island of Greenland is now buried beneath a glacier which is as large as fifteen states the size of New York State.

The Greenland glacier has been made of snow that has fallen in immense quantities on the high interior. You know that you can change a snowball into ice by pressing it in your hands. In a similar way, the pressure of the great mass of snow in Greenland has changed the lower layers into ice. As the snow collects and becomes ice, it spreads out, or *flows*, from the interior toward the coast, much as a piece of wax may spread if a weight is placed upon it. Moving toward the sea, this glacier drags away the soil, tears off fragments of the rock, and scours the rock layers, as if it were a mighty sandpaper. The movement is very slow, yet the ice is always pushing onward to the sea, where enormous *icebergs* are constantly breaking off and floating away (Fig. 17).

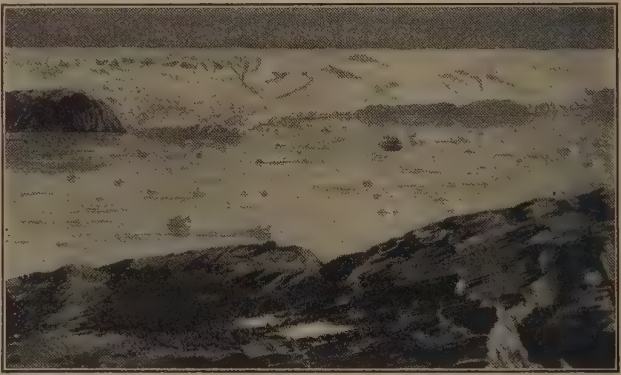


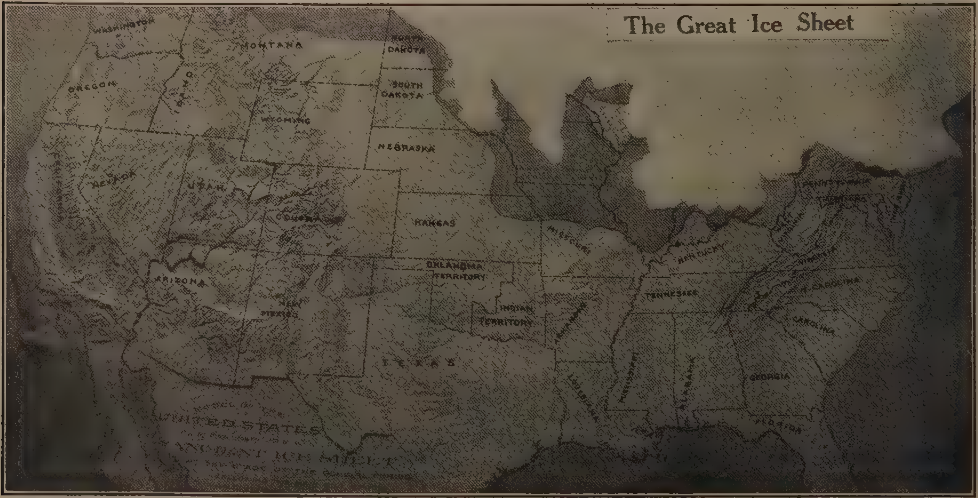
FIG. 17. — A view of a part of the great ice sheet that covers Greenland. Here it reaches the sea and discharges huge icebergs into it.

3. Extent of the Great Glacier

The glacier which formerly spread over a part of our continent was likewise made of snow that had changed to ice. It covered most of the northeastern part of North America, reaching as far south as New York City and the Ohio River; but as you can see from the map (Fig. 18), it did not reach as far south in the Northwest.

4. Changes that the glacier made

Being over a mile deep in its thickest part, and therefore very heavy, the glacier swept away the soil



Model by E. E. Howell.

FIG. 18. — A map to show the extent of the Great Ice Sheet in the United States during the Great Ice Age.

that covered the land. Not only did it do this, but, by the help of rock fragments held fast in its bottom, it scraped off pieces of the solid rock and carried them forward. As it slowly moved over the surface, it also ground bowlders and pebbles together, and rubbed them against the solid rock, scratching and grooving it (Fig. 19). Scratches thus made may still be seen pointing northward, toward the place from which the glacier moved.

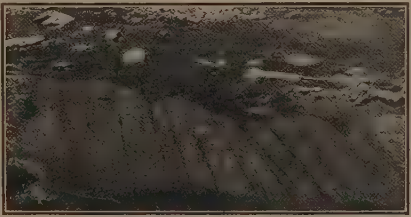


Fig. 19.—Grooves on the rock, made by the Great Ice Sheet as it dragged bowlders along with it.

The rock and soil that the glacier carried along were finally left in various places. Great heaps of clay and gravel, called *moraines* (Fig. 20), were deposited along the outer margin, where the ice melted because of the warmer climate there. The moraine hills, or hummocks, are sometimes one or two hundred feet high.

After standing for a while, and building a moraine in one place, the glacier front sometimes advanced to the south, or perhaps melted away toward the north; and each time that it halted it built up new moraines along its front. During the thousands of years that the Great Ice Sheet lasted, it carried millions of tons of clay and rock from one place to another, and built many low moraine hills.

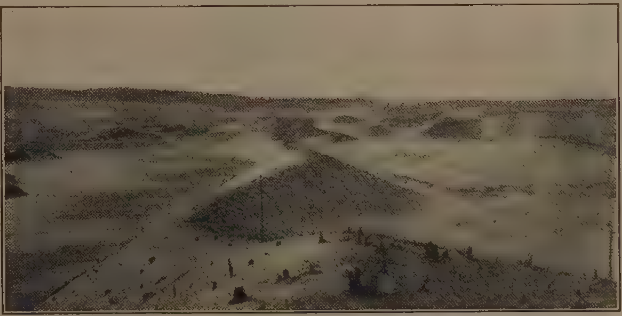


Fig. 20.—Hills of gravel left by the Great Ice Sheet where its front stood for a while.

The work of rasping, digging, carrying, and dumping which was done by the glacier has caused it to be likened to a combined file, plow, and dump cart of enormous size.

5. Effects of the glacier's work

(1) *Upon our lakes*

It was this glacier which caused the great number of lakes and ponds in the northeastern part of North America. Minnesota alone is said to have ten thousand, and in New England also there are many thousands (Figs. 21 and 88). Most of the states outside of the region covered by the ice sheet have very few lakes.

The manner in which these lakes were formed is as follows: The load of clay and bowlders, or *drift*, as it is called, was not dumped evenly over the land. There were hollows and ridges left, and after the ice melted, water filled the hollows, forming ponds and lakes. In other cases the drift partly filled valleys and thus built dams, behind which ponds and lakes collected. Still a third way in which lake basins were formed, was by the glacier digging, or plowing, directly into the rock.

Even our Great Lakes did not exist before the coming of the glacier. Their basins occupy broad river valleys which have been blocked by dams of drift, and deepened by the plowing of the Great Ice Sheet.

(2) *Upon our manufacturing*

The glacier had an important influence upon our manufacturing, also. The deposit of drift in valleys often so filled them that, after the ice was gone, the streams were forced to seek new courses. These courses sometimes lay down steep slopes, or across buried ledges, over which the water now tumbles in many rapids and falls (Fig. 22). Even the great cataract of Niagara

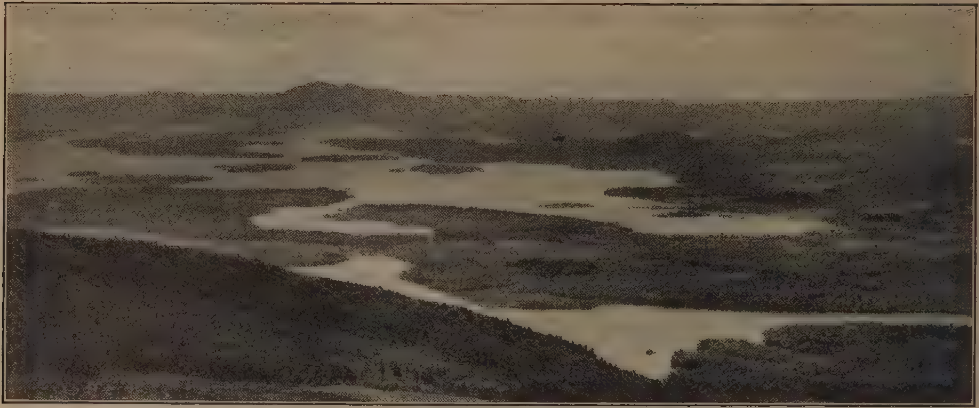


Fig. 21. — Lake Winnipesaukee, in New Hampshire, one of the many lakes of New England caused by the deposits made by the Great Ice Sheet.

(Fig. 68) was caused in this way, and the same is true of many of the falls and rapids of hilly New England and New York. The many lakes act as storehouses to keep the noisy falls and rapids well supplied with water. In this way New England and New York came to have the abundant water power which has helped to make them important manufacturing centers. In sections of our country not reached by the glacier, rapids and falls are much less common. Did the glacier cover the land on which you live? (See Fig. 18.)

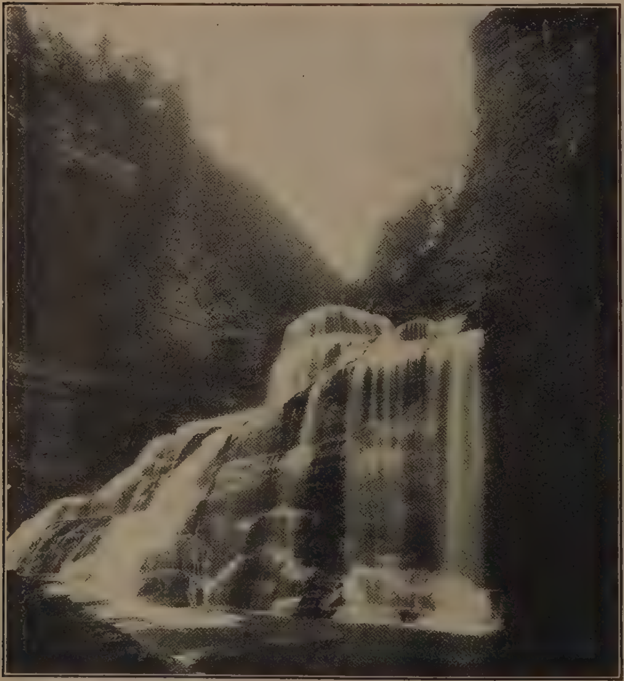


Fig. 22. — Enfield Falls, near Ithaca, New York. One of the many waterfalls caused by the Great Ice Sheet.

(3) Upon our farming

A third important influence of the glacier was upon the soil, and therefore upon our farming. In most parts of the country the soil has been made by the *decay* of rock; but in the region which the glacier covered, the decayed rock was swept away, and drift brought by the glacier was left in its place. This soil was made by the grinding of rocks together, much as flour is made by grinding wheat; in fact, glacier soil is sometimes called *rock flour*. In some places the layer of drift that the glacier left is several hundred feet deep.

The bits of ground-up rock left by the glacier have had an important effect upon the soil. Since they were gathered from many places, and from many different kinds of rock, they sometimes cause a fertile soil in places where the decay of the rocks would naturally have formed a sterile soil. The constant rusting, or decaying, of these rock fragments is also of use in keeping the soil supplied with plant food.

On the other hand, in some places the glacier failed to grind the rock into tiny bits. Instead of that, it left many pebbles, and even large bowlders, to cover the ground and hinder the farmer (Fig. 23). In other places, the great quantities of water supplied by the melting ice washed away much of the rock flour. This left extensive sand and gravel plains that are by no means fertile.

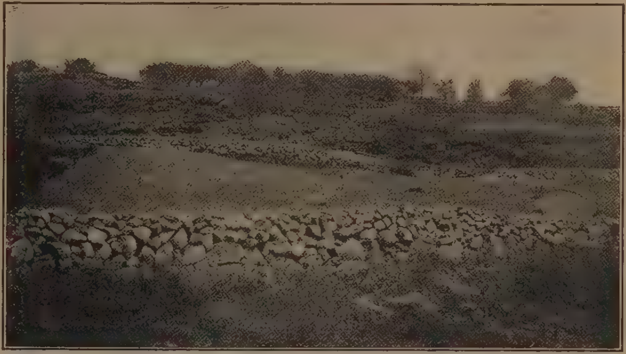


Fig. 23. — A view in New England where the glacier left great numbers of bowlders in the soil, from which these stone walls have been made.

Formation of the coast line

In studying about the Mississippi Valley and the formation of coal, we saw that the sea bottom, and even the dry land, are not fixed and always the same. On the contrary, they often slowly rise or sink.

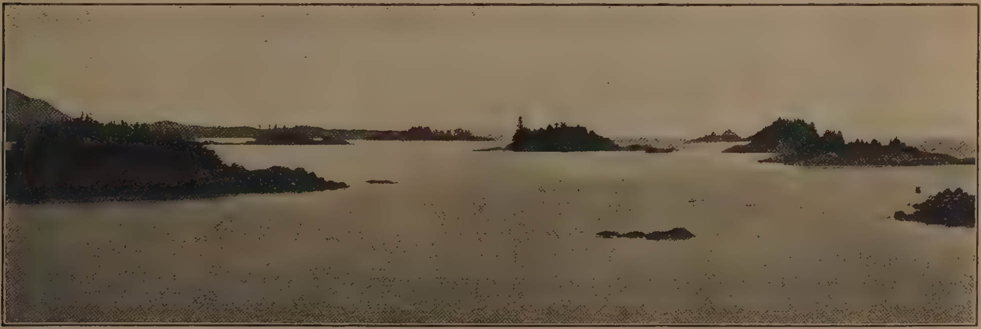


Fig. 24. — A view in the harbor of Sitka, Alaska. Here the land has been lowered, and only the tops of the hills rise above the water, forming many islands.

1. Recent movements of the land

Such changes in the level of the land are even now in progress in many places, though the process is so slow that usually years, and even centuries, must pass before the changes become evident. For instance, the land along the coast of New Jersey is sinking at the rate of about two feet a century, while that around Hudson Bay is rising.

2. Effects of sinking of our northern coast

Some of the recent changes in the level of the land have had an important effect. This is shown on our northeastern coast, where the land has recently sunk several hundred feet. By this sinking the ocean water has been allowed to enter the valleys, leaving the higher land to form peninsulas, capes, and islands, while the valleys have become harbors, bays, and straits (Fig. 45).

The peninsulas of Labrador and Nova Scotia, and the hundreds of islands along the northeastern coast, including Newfoundland, have been formed by this sinking of the land. The irregular Pacific coast, from Puget Sound northward (Fig. 24), was caused in the same way.

Many good harbors were made by this sinking of the land, the best being where rivers enter the sea. When the land was higher, the streams carved out broad valleys; but as the land sank, the sea entered, forming extensive bays and fine harbors. In this way the Gulf of St. Lawrence was formed; also New York, Delaware, Chesapeake, and San Francisco bays, as well as many excellent harbors on the east and west coasts. What rivers carved out the bays mentioned? (See Figs. 41 and 219).

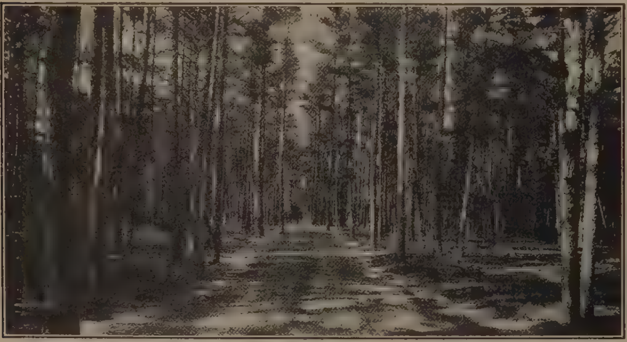


FIG. 25. — A view on the level coastal plain — once a sea bottom — which borders the coast south of New York.

3. Effects of rising of our southern coast

One reason for so few good harbors along the coast of the Southern States is that the land in that section has been *rising*. Just off the coast is a broad ocean bottom plain, called the *continental shelf*, where the water is shallow (Figs. 11 and 95). If the continental shelf were raised, it would form a plain.

That part of the Southern States which borders the Gulf of Mexico and the Atlantic Ocean was once a portion of this continental shelf, but it has been raised until it is now a low plain (Fig. 25). The continental shelf is so level that when a part of it was lifted above the water there were few places for deep inlets, bays, and harbors. After the plain was raised, however, the coast was slightly lowered; but the bays thus formed are still shallow, and most of the harbors poor. The Florida peninsula is also a sea-bottom that has been slightly lifted above the ocean.

Present size, shape, and position of our continent

After changing during millions of years, owing to the rising and sinking of the land, North America is now third in size among the six continents of the earth. Which are larger? Which are smaller? (See Appendix, p. 424.) The continent has the form of a triangle, with the broadest portion in the north. Draw the triangle. Compare its shape with that of South America (Fig. 1). Of Africa (Fig. 1).

The northern part is so wide that Alaska extends to within fifty miles of Asia, a distance so short that the early ancestors of our Indians and Eskimos probably first reached North America by that route. Labrador, the part of the continent that extends farthest east, is over two thousand miles from Europe. On account of the great distance across the Atlantic, Europeans for a long time knew nothing of North America. It is certain, however, that the Norsemen from Scandinavia visited our shores nearly five hundred years before Columbus discovered the continent.

Importance of this position

Most of the inhabitants of North America live far to the south of Alaska and Labrador, and here the oceans are much broader. Thus the inhabited portion of the continent is a long distance from Europe on the east, and a still greater distance from Asia on the west. This wide separation from other continents has had great influence upon the development of the people of North America. It helps to explain, for instance, why the Spanish colonies were able to win their independence from Spain, and the United States their independence from England; for the distance across the sea was too great to send large armies, and the supplies necessary for their support.

Our distance from other continents helps also to explain the growth of our industries. At first the colonies imported even bricks, doors, and timber from Europe. But it proved so troublesome and expensive to carry such goods so far, that our settlers soon learned to produce for themselves most of the articles they needed.

Now that men have learned the use of steam, the distance from other countries is not so serious a drawback. Sailing vessels were very slow, and always at the mercy of winds and storms. Steamships, on the other hand, are easily controlled, and may go as far in one day as the old-fashioned sailing vessels traveled in a week. With the use of steam, therefore, immigrants from Europe have found their way here by millions; and trade with the countries of Europe, South America, Asia, and other parts of the world has rapidly developed. Steam has made the ocean an excellent highway for reaching distant points. Thus our separation from other continents has helped in many ways to make us independent, without bringing serious disadvantages.

Review Questions

1. How has the story of the growth of our continent been learned? 2. Describe the birth and early history of the continent. 3. From what is coal made? Give proof. 4. How have the coal beds been formed? 5. Name the different kinds of coal and give reasons for the difference. 6. What about the making of other minerals? 7. How were the mountains and plateaus formed? 8. What can you tell about the formation of the Appalachian Mountains and surrounding plateaus? 9. About the formation of the Cordillera and surrounding plateaus? 10. How were the volcanoes formed? State other facts about them. 11. How was the trough formed between the Appalachians and the Cordillera? 12. Show how this arrangement of mountains and lowlands is of great importance. 13. Describe the glacier now found in Greenland. 14. What was the extent of the Great Ice Sheet on our continent? 15. What changes did it make? 16. What were the effects of the glacier's work upon our lakes? 17. Upon our manufacturing? 18. Upon our farming? 19. What have been some of the effects of the sinking of our northern coast? 20. Of the rising of our southern coast? 21. What is the present size, shape, and position of our continent? 22. Explain the importance of this position.

Suggestions

1. Make a collection of different kinds of coal. 2. Examine some pieces of *soft* coal closely, to see if you can discover plant remains. 3. Obtain some peat. 4. Examine layers of rock in your neighborhood, to see if they contain fossils. 5. Make a drawing similar to Figure 14. 6. Make a model of a volcano out of sand or clay. 7. What becomes of the Greenland icebergs? 8. Make a sketch map showing the extent of the Great American Ice Sheet. 9. What signs of the glacier, if any, can you find in your neighborhood? 10. Draw an outline map of the northeastern coast, and another of the southern coast, to see how they differ. 11. How many days long is the voyage, on a fast steamer, from New York to Liverpool? How many miles is the distance?

II. PLANTS, ANIMALS, AND PEOPLES OF NORTH AMERICA

1. Plants and Animals

Influence of climate on plants and animals

One of the most important things to know about a region is its *climate*, that is, its temperature and rainfall. Where these are favorable, plants usually flourish; and since plants furnish food to animals, animal life thrives wherever vegetation is abundant. Because North America extends far north and south, and has lofty mountain ranges and inclosed plateaus, it has many different kinds of climate. Therefore it has a great variety of plant and animal life.

Plants of the Far North

The northern part of our continent is bitterly cold; and over a vast area the soil is always frozen, except at the very surface, where it thaws out for a few weeks in summer. On account of the frost, trees, such as we know, cannot grow there, for their roots are unable to push through the frozen ground and find the necessary plant food. There are some willows, birches, and a few other woody plants; but instead of growing to a good height, as our willows and birches do, these creep along the surface like vines, and rise but a few inches above the ground. Only by hugging the earth can they find protection beneath the snow, and thus escape the fierce blasts of winter.

A few grasses and small flowering plants grow rapidly, produce flowers, even close by the edge of snow banks (Fig. 26), and then die, all within the few short weeks of summer. Some of these plants develop berries, which, after ripening, are preserved by the snows, so that when the birds arrive in the spring, they find food ready for them.

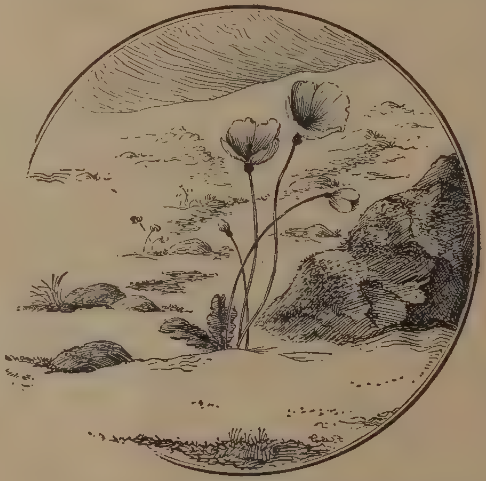


FIG. 26. — An Arctic poppy in blossom, although growing on the edge of a snow bank.

Animals of the Far North

1. Insects

The growth of insects in summer is rapid, like the growth of plants. As the snow melts, and the soil thaws at the surface, the ground becomes wet and swampy, and millions of insects appear. Among them the most common is, perhaps, the mosquito. There are few parts of the world where this creature is a worse pest than on the *barrens*, or *tundras*, as these treeless, frozen lands of northern North America, Europe, and Asia, are called.

2. Larger animals on land

Few large land animals thrive in so cold a climate, where there is such a scarcity of plant food; and the cold-blooded animals, or reptiles, cannot live there. The reindeer, or caribou, the musk-ox, and polar bear are the largest four-footed land animals (Fig. 27); and the crow, sparrow, and ptarmigan are the most common land birds.

3. Color protection, and food of these animals

The plumage of the ptarmigan changes to white in winter, and other animals, such as the fox, polar bear, baby seal, and hare, are also white. This helps them, in that land of snow and ice, to hide from their enemies, or to steal upon their prey unawares. The small white fox feeds upon birds and other animal food, and the polar bear lives mainly by hunting the seal. His white fur makes him almost invisible, and he steals noiselessly upon his prey, asleep upon the ice; or, he patiently watches until his victim swims within reach, and then seizes him with his powerful claws (Fig. 314).

The other land animals live upon plants, such as berries, grass, and moss. The caribou eats the plant called "reindeer moss," which grows upon the rocks. If it were not for this, he would be unable to live through the long winter. To find this moss and other plants, he often has to scrape away the snow which covers the ground.

4. Sea animals

Many more animals have their homes in the sea than upon the land, because there, except at the very surface, the temperature never goes below the freezing point. Therefore there are plenty of sea animals of all sizes, from those so small that they cannot be seen without a microscope, to the whale, the largest of all animals.

Sea birds exist by tens of thousands, building their nests upon the rocky cliffs (Fig. 27). Indeed, they are so numerous that, when suddenly frightened by the firing of a gun, they rise in a dense cloud that hides the sun; and with their cries they produce a din that is almost deafening.

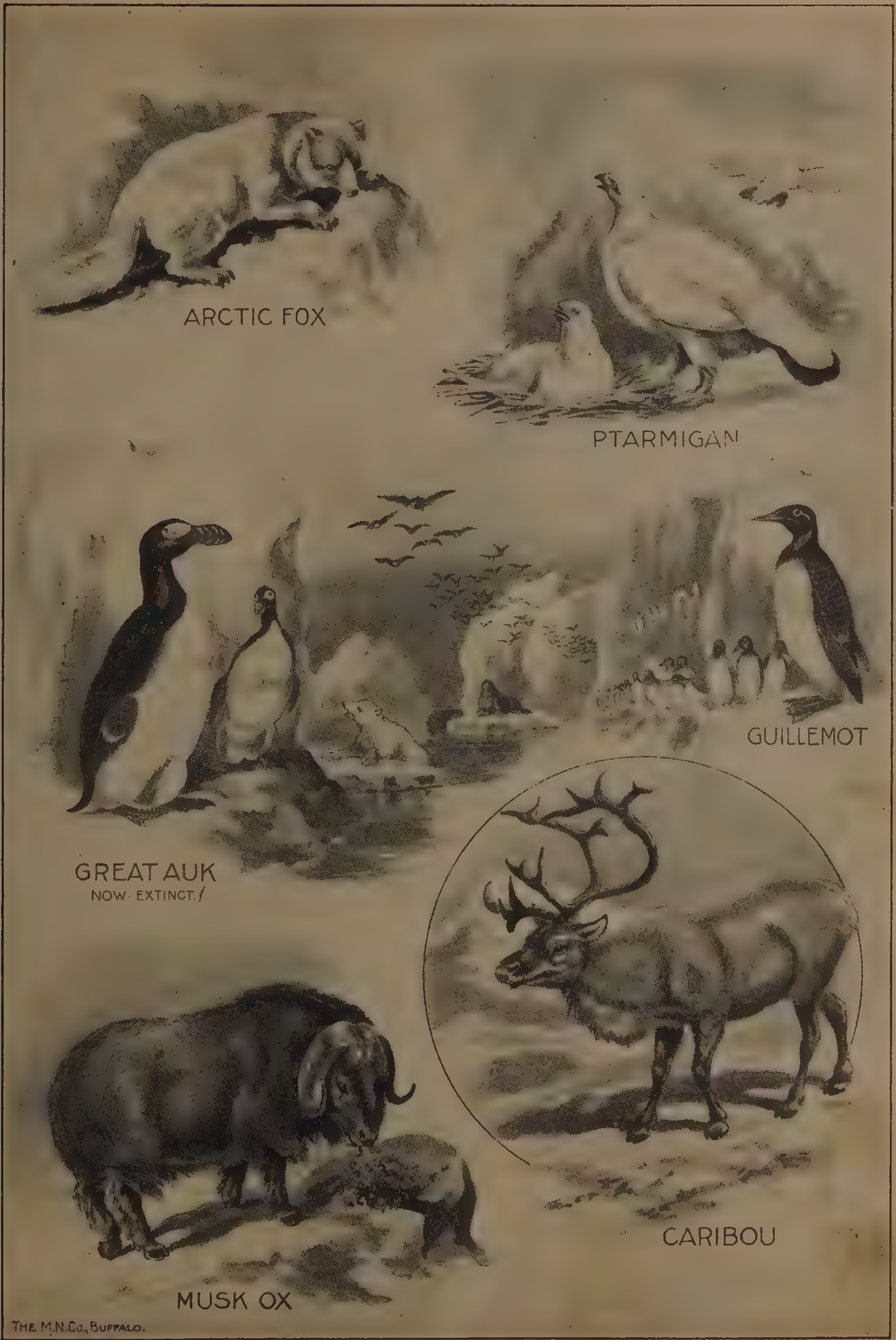


FIG. 27. — Some of the birds and four-footed animals of the Far North.

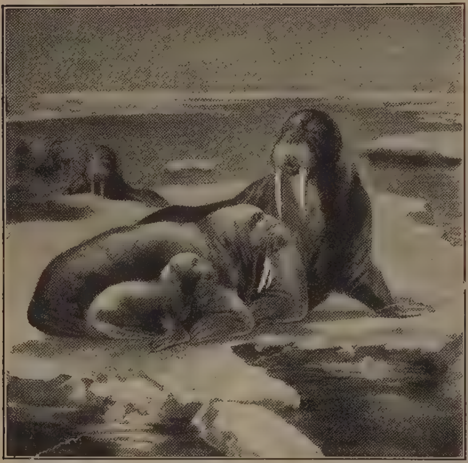


FIG. 28. — Walrus on the ice that is ever present in the Arctic Ocean.

Seals (Fig. 225) and walruses (Fig. 28) live in the water, the former being so valuable for their oil and skins, that men go on long voyages to obtain them. The oil comes from a layer of fat, or "blubber," just beneath the skin, that serves to keep out the cold. The seal is the most common of the larger Arctic sea animals, and is the principal food of the Eskimo, as well as of the polar bear.

5. Migration southward in winter

During the winter the surface of the sea freezes over. Then many of the animals of the Far North migrate southward. Even the huge walrus (Fig. 28) moves clumsily toward a warmer climate. The birds go farthest, especially the geese, ducks, and gulls, which fly to Labrador, New England, North Carolina, and even farther south.

Plants and animals of the temperate zone

1. In the arid West

(1) *Plants of this region*

A large area in the western part of the United States and in Mexico has a very slight rainfall, although the temperature is agreeable. This arid area includes most of the territory in which the rainfall is twenty inches or less during one year (Fig. 303). In some places, as near the Pacific coast and upon the high plateaus and mountain tops, there is rain enough for forests; but in most parts of the Far West the climate is so dry that there are no trees whatsoever. Indeed, some portions are true deserts.

One common plant in the arid lands is the bunch grass, so called because it grows in little tufts, or bunches, having a dozen or more blades. The sagebrush (Fig. 29), a plant with a pale green leaf, named because of its sagelike odor, is found throughout most of this arid region. Other common plants are the mesquite; the century plant, with its sharp-pointed leaves; and the cactus, with its numerous thorns.

(2) *How these plants manage to live*

On account of the dry climate, these plants have a severe struggle to live, and they protect themselves in peculiar ways. For example, the cactus, unlike most plants, has no true leaves. Thus it exposes little surface to the air for evaporation. In its great, fleshy stem, it stores water for use through the long, dry seasons, while its needle-like spines protect it from animals in search of food.

The mesquite also protects itself by spines, and, in addition, it has such large roots that the part of the plant underground is often greater than that above. The roots of this plant furnish much wood for fuel. Some of these plants, like the sagebrush, have such

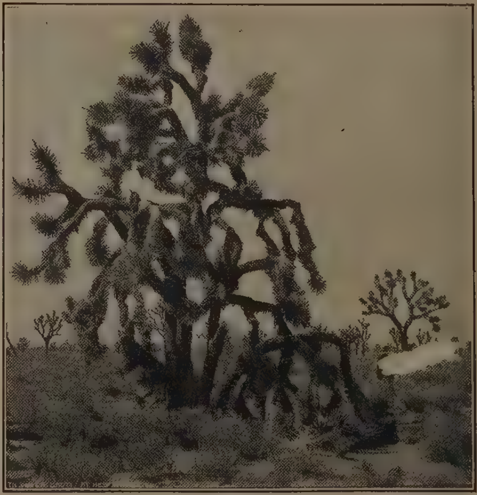


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FIG. 29. — A view in the desert of Southern California. The low plants are sagebrush; the higher ones, with spiny branches, are Yucca.

a disagreeable taste that animals will not eat them. Thus they are further protected.

(3) *Animals of this region*

At one time the most common animal in much of this arid section was the bison, or buffalo (Fig. 30), whose home was on the prairies and arid plains east of the Rocky Mountains. Thousands upon thousands of bison were slaughtered for their hides and tongues alone, and their bones left to whiten upon the plains. There are now no wild bison in the United States, except a few in the Yellowstone National Park of Wyoming, where they are protected by the government (Fig. 196).

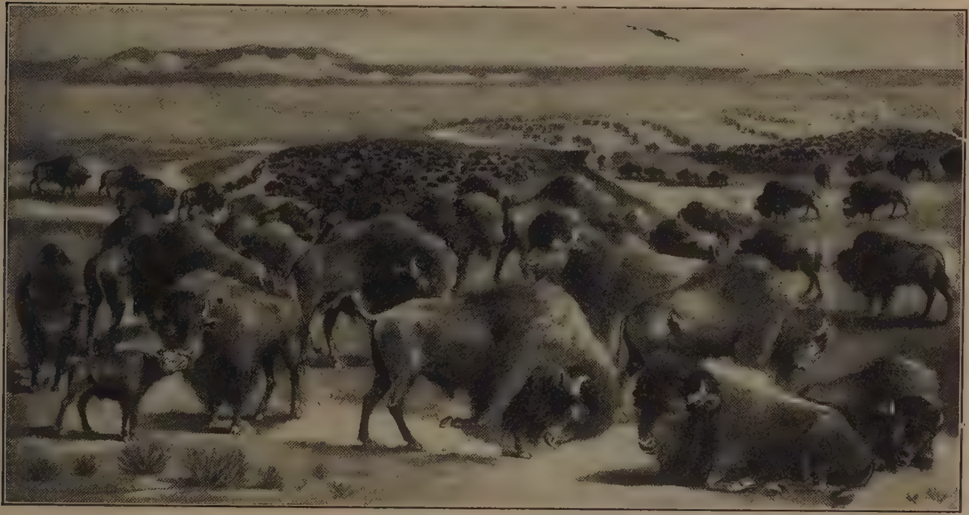


FIG. 30. — A herd of bison, which once roamed over central United States.

The graceful antelope, the cowardly prairie wolf, or *coyote*, and the rabbit, upon which the coyote feeds, are still to be seen (Fig. 31). Among the rabbits is the long-legged jack rabbit, which leaps across the plains with astonishing speed.

The fierce puma, or mountain lion, and the ugly cinnamon and grizzly bears (Fig. 31) still live among the mountains, though they are now rare and difficult to find. Deer and elk inhabit the forest-covered mountains of southern Canada and the northwestern part of the United States; and among the higher peaks a few mountain goats and sheep are still to be found (Fig. 31).

Since no hunting is allowed in the Yellowstone National Park, many of these animals are seen there. Deer and elk are common; also black, cinnamon, and grizzly bears, which are so tame that at night they come close to the hotels to feed upon the garbage.

2. In other parts of temperate North America

(1) *Plants of this region*

Between the frigid and torrid zones, and both east and west of the arid region, is a temperate belt of *moderate* rainfall. The climate is warm in the south, cool in the central part, and cold in the north. Here both the plants and animals differ from those of the arid regions.

In the warm southern part, the plant and animal life is abundant, and of many kinds. Both plants and animals become less numerous and less varied toward the north, until, near the Arctic zone, they are scarce and few in kind. The pines and oaks of the United States give place to the spruce, balsam fir, and maple in Canada; farther north these gradually become stunted and disappear; and finally the treeless barrens are reached.

Some persons believe that at one time most of the eastern part of the United States

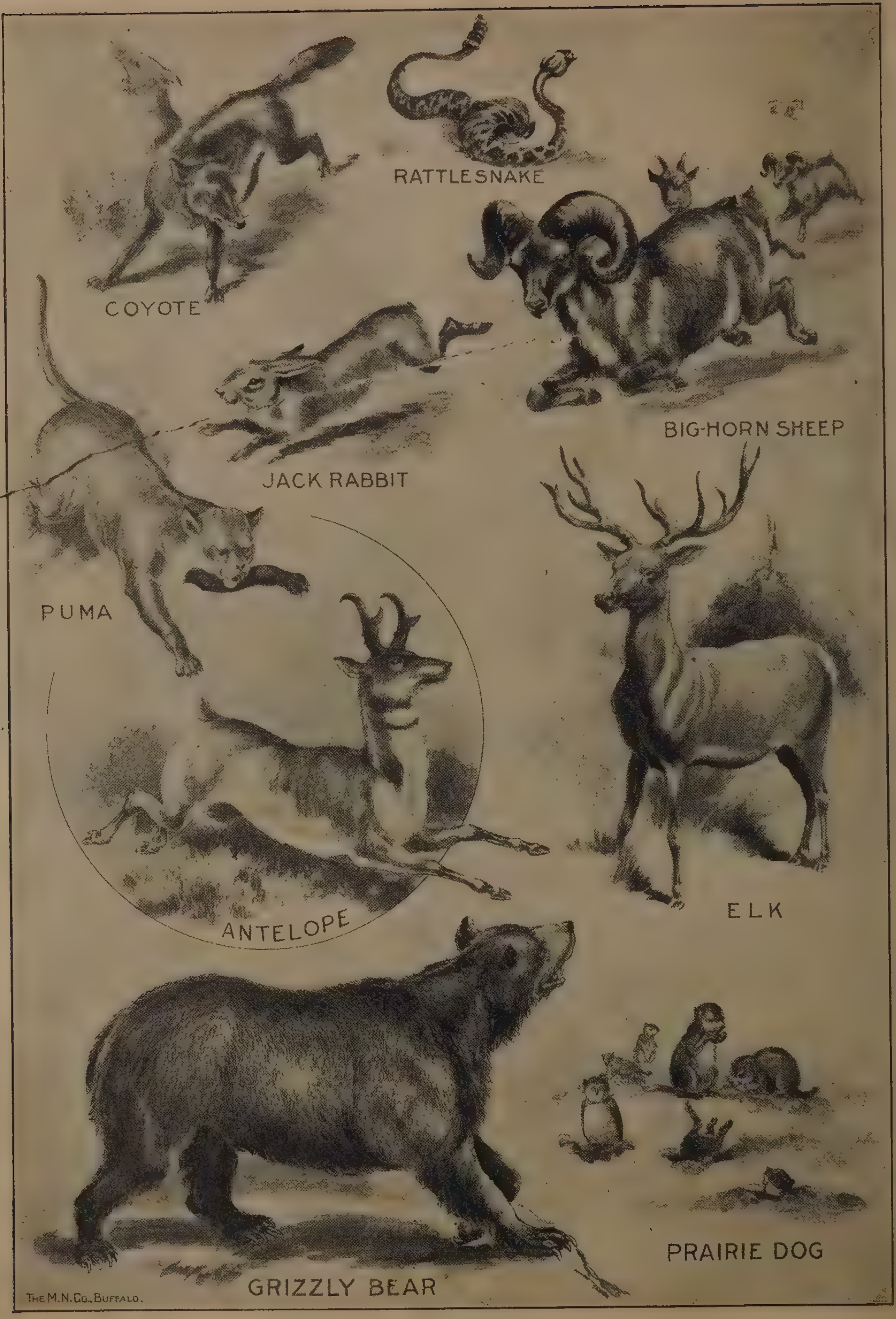


Fig. 31.—Some of the animals of the Far West.

was wooded, including the fertile prairies of the Mississippi Valley. They think that the trees were burned from the prairies by fires set by the Indians. Others believe that the prairies were always treeless, being too level and swampy for trees to grow.

(2) *Animals of this region*

When America was first visited by Europeans, our woods abounded in deer (Fig. 32), moose, caribou, wolves, and foxes (Fig. 33). Beavers built dams across the streams; the mink and otter fished in the waters; and bears roamed at will. Among the birds, the eagle was common (Fig. 33), and wild pigeons and turkeys were so abundant that they were one of the principal foods of the early settlers.

Now most of these animals have been destroyed, although some still live in the forest and mountain region. Some of them, like the deer, are now carefully protected by state laws, which prohibit shooting them except at certain seasons, and then only in small numbers. In the forests of Canada and in Alaska, many wild animals are still left.

Fig. 32. — A wild deer on the edge of the forest.

3. Native plants nd animals hat will remain

It might seem that the native plants and animals of temperate North America would soon disappear. For the white man has come into possession of the land, and has cut down much of the forest, and plowed the prairies, o that where trees once stood, and game was plenty, there are now fertile farms and hriving cities. Not all will be destroyed, owever, for some of the forests will remain, nd many wild plants will grow in the ncultivated spots. The birds and some of he smaller animals will be able to survive; nd in the forests larger animals, protected to some extent by law, will continue to roam about freely. In addition, a few of the animals and plants, which man has found useful, have been domesticated, and these will continue to thrive.

Our domesticated plants and animals well illustrate how man has learned to make use of nature. At one time, every variety of plant that we now cultivate was wild; and our domesticated animals have all come from wild stock. Most of these have been found in Europe and Asia, but America has added some to the list. The Indian corn, or maize, the tobacco, tomato, pumpkin, and potato were unknown to the Old World until America was discovered. The same is true of the turkey, and perhaps, in a hundred years, the bison may be included among the domesticated animals, for a few small herds are now being carefully reared on the cattle ranches of the West.

Plants and animals in the torrid zone

1. The plants in this region

In the torrid zone, the climate is warm or hot, and in most parts the rainfall is so heavy that the conditions are favorable for dense vegetation. Indeed, the tangle of growth in the forests is so great that it is often impossible to pass through it without hewing one's way. Besides trees and underbrush, there are quantities of ferns, vines, and flowers, many of which hang from the trees with their roots in the air instead of in the ground. They are able to live in this way on account of the moisture in the air. Among the trees are the valuable rosewood, mahogany, ebony, and rubber tree, and among the flowers are the beautiful orchids. On account of the

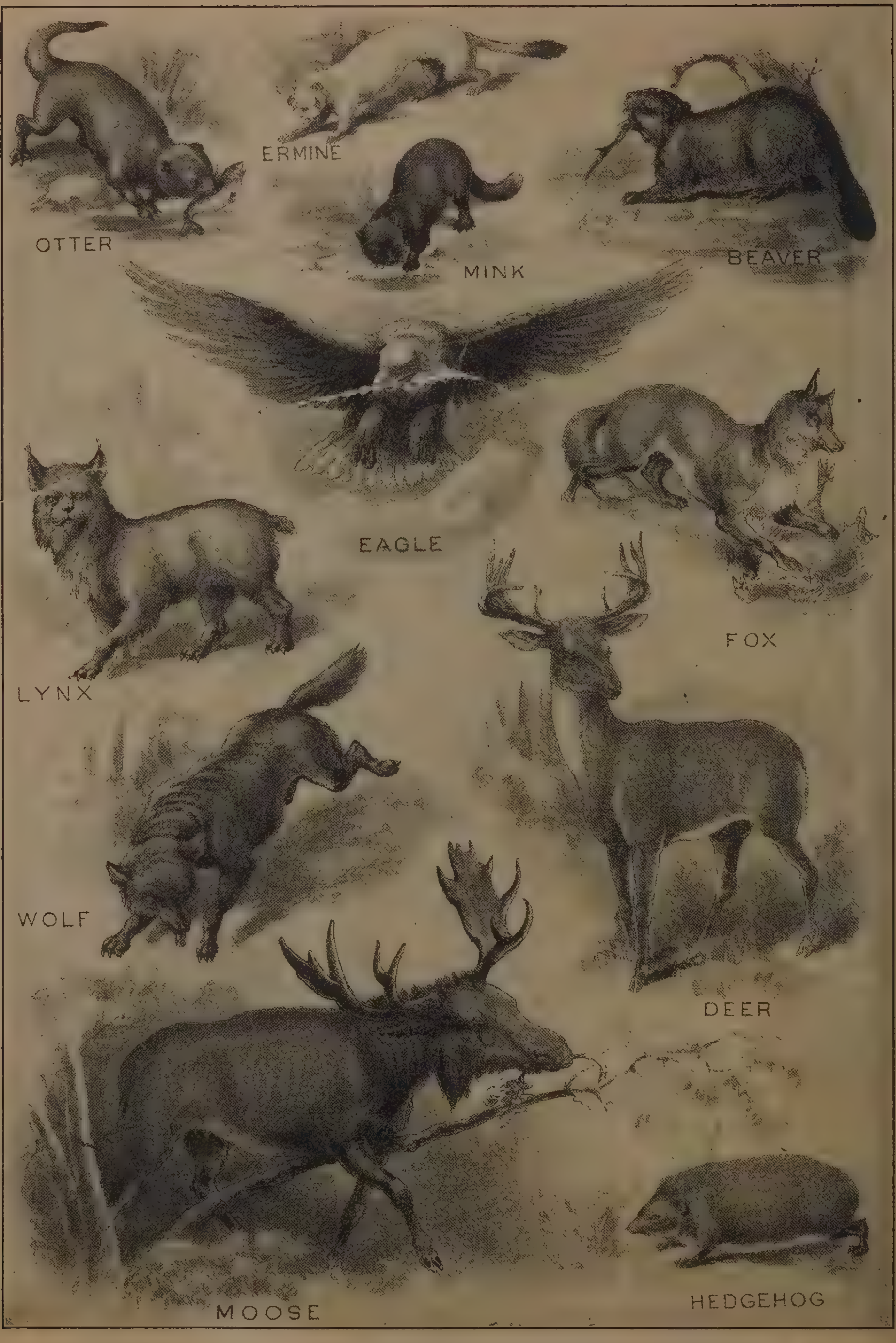


FIG. 33.—Some of the animals of northeastern United States and southeastern Canada.

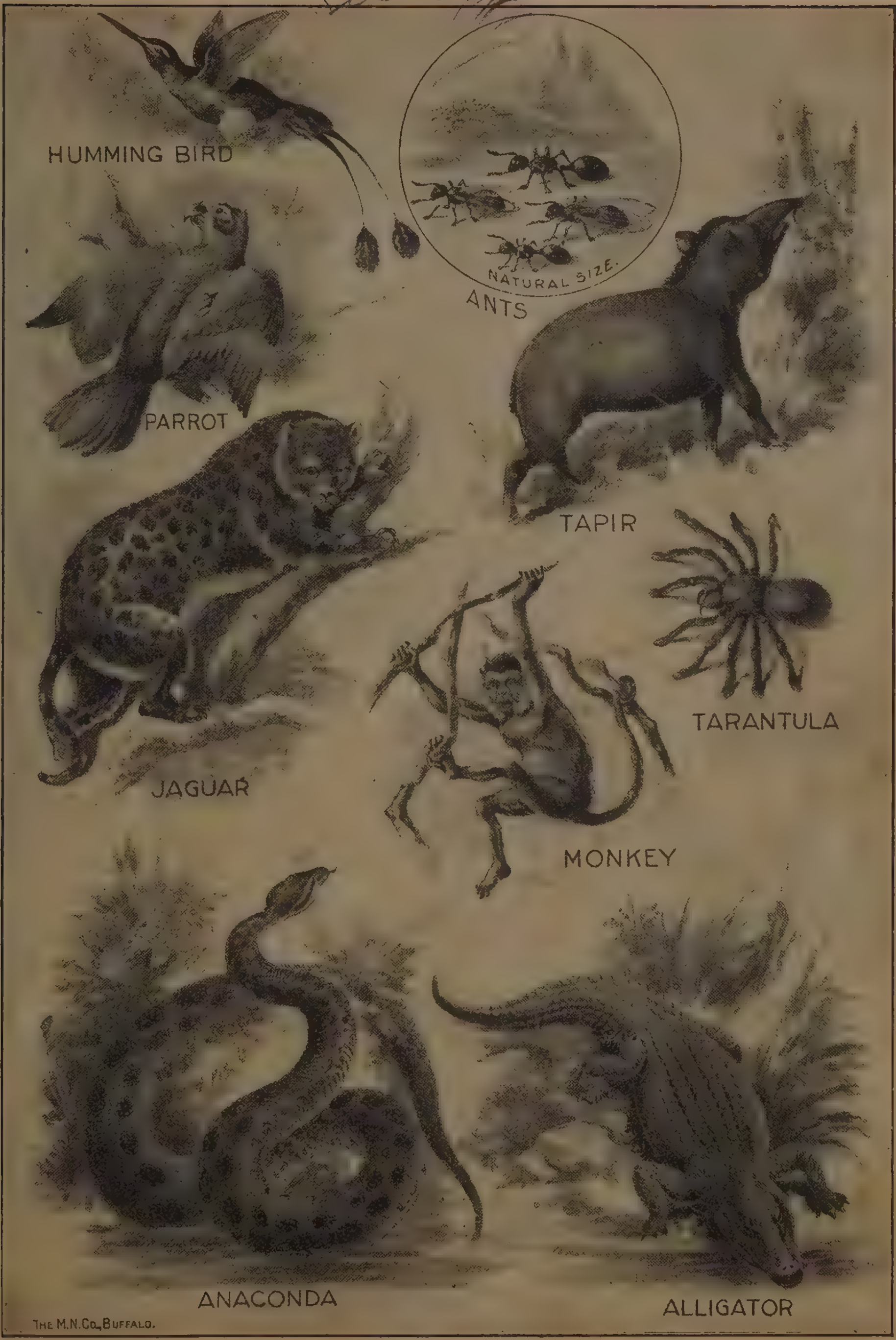


FIG. 34.—Some of the animals that live in the tropical part of North America.

continual warmth and dampness, many plants, such as the banana, bear fruit throughout the year.

2. The animals in this region

In the midst of such luxuriant vegetation, animal life is wonderfully varied and abundant. There are the tapir, monkey, and jaguar (Fig. 34); brilliantly colored birds, such as parrots and humming birds; and there are millions of insects. Scorpions and centipeds abound, and ants exist in countless numbers, some in the ground, others in decayed vegetation. Serpents, some of which are poisonous, are common in the forests; and in the rivers are fish and alligators, the latter being found as far north as Florida and Louisiana.

2. Peoples

The Eskimos

America was inhabited for thousands of years before it was discovered by white men. To the natives in the southern part Columbus gave the name *Indians*, in the belief that he had reached India. Those in the Far North, who live on meat, are called *Eskimos*, a word meaning flesh-eaters (Fig. 35). What do you recall about their manner of life from your study of the First Book?

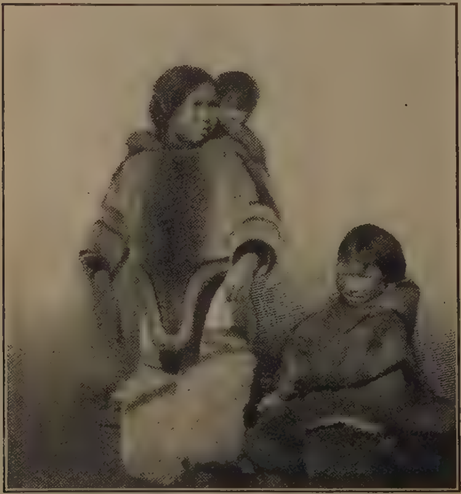


FIG. 35. — An Eskimo mother and her children. The very young children are carried on the back in a sealskin hood.

FIG. 36. — An Indian woman and child.

The Indians

1. Their distribution

Indians were at first scattered over most of the country south of the Arctic Circle. That this was so is suggested by the many places that bear Indian names, such as Narragansett, Erie, Niagara, Huron, Ottawa, Illinois, Dakota, Pueblo, and Sioux City.

2. Their civilization

Some of the tribes were true *savages;* others, not so savage, may be classed as *barbarians*. The barbarians raised "Indian corn," pumpkins, and tobacco; they baked pottery; used tools and weapons made of stone; and lived in villages.

The Indians that were most nearly civilized lived in the southwestern part of what is now the United States, in Mexico, and in Central America. Much of that region is arid, but the Indians raised crops by irrigation, and built houses of stone and sun-dried brick (Fig. 37). These houses, called

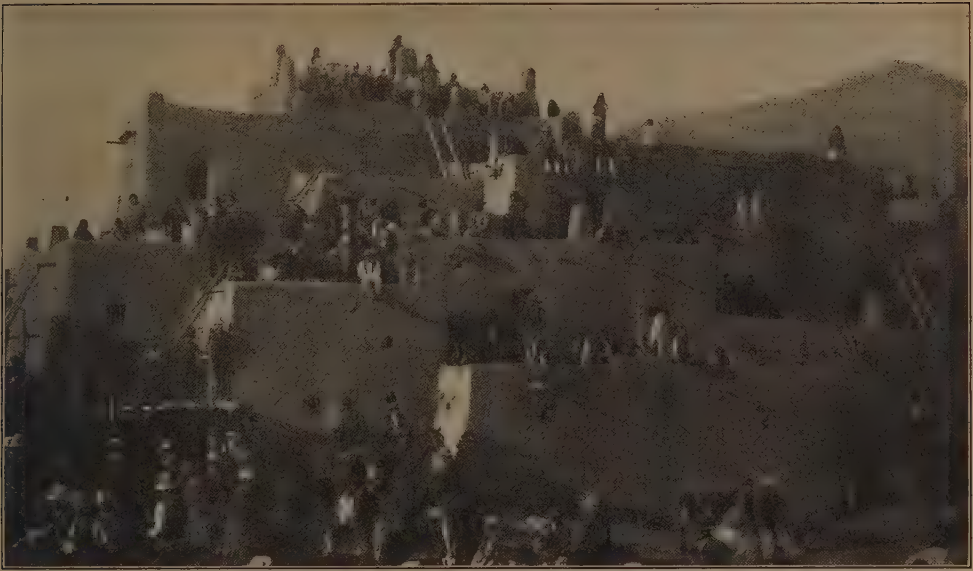


FIG. 37. — An Indian Pueblo in New Mexico, called the Taos Pueblo. It is made of adobe, or sun-dried brick, and to enter the rooms the Indians must first climb a ladder.

pueblos, were used partly as homes for protection from the neighboring savages, and partly as storehouses for grain.

The most noted among these Indians were the *Aztecs*, who lived in and near the region where the City of Mexico now stands. They had a much better government than the barbarous and savage tribes; they mined gold and silver, and made various articles out of these metals; they wove blankets, and ornamented their pottery and their buildings in an artistic manner. Living the quiet life of the farmer, the Aztecs preferred peace to war, and a settled home to the nomadic life of the hunter.

3. Why they never became more powerful

Although some tribes thus approached civilization, the Indians, as a race, never became a powerful people. There are several reasons for this.

(1) Because of their small number

In the first place, there were never very many Indians. There are probably nearly as many now living in the United States as ever lived here. Yet all of them together number only a little over a quarter of a million, or about the number of persons now living in Washington, the capital of our country.

(2) Their division into many independent tribes

Again, instead of forming a union, and living at peace with one another, they were divided into many independent tribes. Each tribe had a certain section over which it could roam and hunt, but if it went beyond this, war might follow. War did follow very often, and thus they were constantly weakened by fighting.

(3) The level nature of the country

The level nature of a large part of the country greatly increased this danger of war, and prevented any one tribe from advancing in civilization much beyond its neighbors. Had the surface of North America been very mountainous, there might have been some places where a tribe would be protected by surrounding mountain walls.

Then those Indians might have dared to devote themselves to other work than war; and they might even have collected wealth and developed important industries.

But the vast plains of the Mississippi Valley, and the extensive plains and low mountains of the East, afforded little protection. If any one tribe had built good homes in this section, and collected treasures within them, the neighboring Indians would surely have attacked them. The Aztecs were constantly in danger from this cause. However, the fact that they were *partly* protected by mountains and deserts, was one of the reasons why they became more civilized than the Indians of the Northeast.

(4) *Absence of domestic animals*

The fact that the Indians had no domestic animals for use in agriculture, was another reason why they did not make more progress. The horse, cow, ass, sheep, goat, and hog are of great service in supplying food and materials for clothing, or for helping in farm work. Without them farm work becomes the worst drudgery, because it is then necessary to do all the work by hand. Since the Indians had none of these animals to help them, they could do little farming.

(5) *Lack of food*

Still another reason was lack of food. Although there was much game, the supply was never sufficient to support a dense population for a long period. Even the scattered Indian population was obliged to wander about in search of it. This prevented them from living quietly in one place, and finding time for improvement.

All these facts helped to prevent the Indians from becoming civilized. On the other hand, the fact that they were not better civilized was a great advantage to the white men; for that made it easier to obtain possession of the New World.

The Spaniards

The astonishment of Europe was great when it was proved that there were vast territories on this side of the Atlantic held only by savages. America was pictured as containing all sorts of treasures, and European nations outdid one another in fitting out expeditions to take possession of them.

1. Section of the continent taken by them

The Spaniards naturally led, for at that time they were one of the most powerful nations of Europe; and besides, they had sent Columbus on his voyage of discovery. Columbus sailed from Palos, in Spain, on his first voyage, and his ships were carried by the winds southwestward to the West Indies, a point much farther south than Spain itself. On a globe find the point on our coast that is about as far north as Madrid.

The section reached by the Spaniards had a climate somewhat like that of their own country, and they easily made themselves at home there. Soon they came into possession of most of South America, Central America, Mexico, and the southwestern part of the United States (Fig. 38). The Spaniards had one advantage over the English and French, who settled farther north; the portion of the continent that they discovered is so narrow that they easily crossed it. Thus they were able to explore both the Atlantic and the Pacific coast. It was largely because of this fact that the Spanish settled the western coast as far north as San Francisco.

2. Their treatment of the natives

While robbing the Aztecs of immense quantities of gold and silver, the Spaniards introduced many Spanish laws and customs; in addition they cruelly mistreated the natives, killing many and enslaving others, forcing them to work in the mines and fields.

3. Why the Spaniards have not held their territory

Although Spanish-speaking people still occupy Mexico and Central America, Spain herself has now lost all hold upon this continent. Her last American colonies, Cuba and Porto Rico, were recently given up.

One of the reasons why the Spaniards have not been more successful is the climate of the section which they settled. In hot countries so little energy is required to pro-

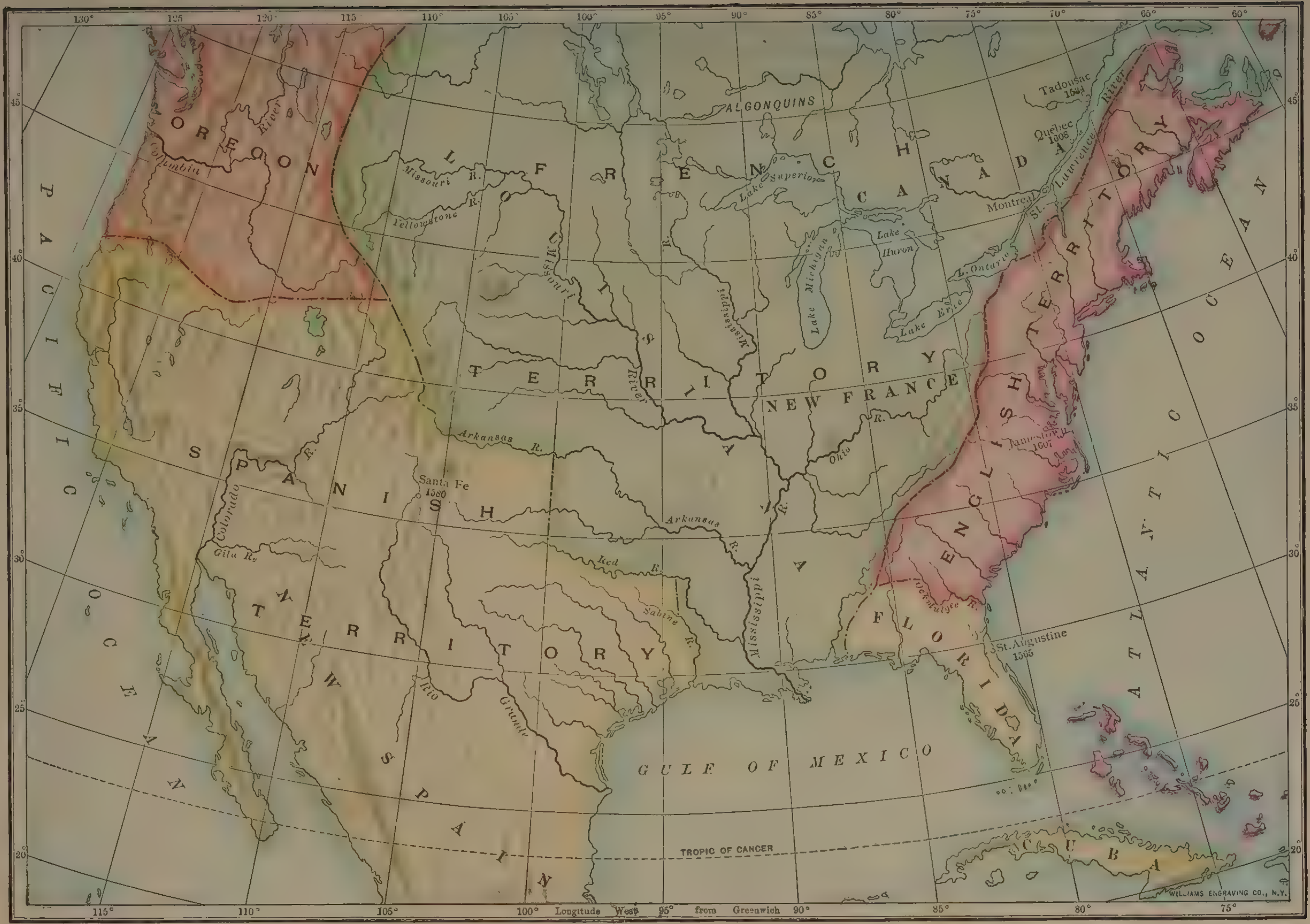


FIG. 38.
Map showing the claims of France, England, and Spain upon the central part of North America in 1760.

vide food and shelter that the people do not need to exert themselves; and hence they do not do so. With but slight effort the Central American can find bananas, or other nourishing food, at almost any season of the year; why then should he work? The people, therefore, become too lazy to improve their condition. A large part of the region settled by the Spaniards is too warm to produce people of energy.

Another reason why the Spaniards did not have better success is found in their relation to the Indians. Although robbing and enslaving them, they intermarried with them freely, so that a large portion of the people are now half-breeds. These half-breeds are an ignorant class, far inferior to the Spaniards themselves, and so backward (Fig. 39) that they still follow many of the customs of the Aztecs.

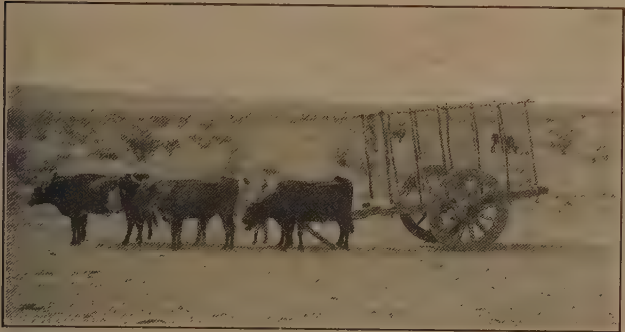


FIG. 39. — Mexican two-wheeled cart with wooden wheels, such as a backward people might use.

The French

The French began their settlements in a very different quarter, being early attracted to our coast by the excellent fishing on the Newfoundland Banks. Soon the fur trade with the Indians proved profitable, and the French took possession of Nova Scotia and the region along the St. Lawrence River and the Great Lakes.

1. Location of their settlements, with reasons

The value of the fur trade, together with a desire to convert the Indians to Christianity, led the French as far west as Wisconsin and to the headwaters of the Mississippi River. Making their way southward to the mouth of that river, they took possession of the whole Mississippi Valley (Fig. 38), calling it Louisiana in honor of their king, Louis XIV. In order to hold this vast territory, they established a chain of trading posts and forts from the Gulf of St. Lawrence to the Gulf of Mexico. One of the most important of these forts was built where Pittsburgh now stands. Many places in the St. Lawrence and Mississippi valleys still have French names; for example, Lake Champlain, Marquette in Michigan, La Salle in Illinois, St. Louis, and New Orleans. Can you name others?

2. Some reasons why they have lost this territory

The climate of the French territory was, on the whole, more favorable than that of the Spanish country; for, though rather severe in the St. Lawrence Valley, it was neither hot enough to make people lazy, nor so cold as to discourage them. One of the greatest difficulties was that the few scattered settlers were unable to protect all of the vast territory to which the French laid claim. Also, the French intermarried with the Indians and adopted some of their customs, although not to so great an extent as the Spaniards.

The English

1. Location of their earlier settlements

The Spanish and French left only a narrow strip along the Atlantic coast for other nations. Among those who made settlements there were the Dutch in New York, and the Swedes in Delaware; but the English soon obtained the lead. The English captured New York City (then called New Amsterdam) from the Dutch, and made settlements along most of the coast from Florida to Nova Scotia.

In several respects the portion that fell to the English seemed much less desirable than that held by the Spanish and French. Yet the English-speaking race has managed, not only to hold this, but even to add to it most of the possessions of the other two. At the present time, the control of the entire continent, except Mexico, Central America, and a few small islands, is in the hands of either the United States or Great Britain.

2. Territory now occupied by English-speaking people

There are, of course, good reasons for this remarkable result. No doubt, differences in the characters of these three races is one cause. Yet there are others also, as is shown in the following paragraphs.

3. Reasons for this

The temperate climate of the central portion of North America is one of the best in the world for the production of people of energy. The warm summers allowed abundant harvests; while the long, cold winters forced the settlers to work hard in order to store up supplies for the cold season; but, although they had to work a great deal, they still had time and energy left for improvement.

Again, the English were less cruel than the Spaniards in their treatment of the Indians; but, unlike both French and Spanish, most of the English would not intermarry with savages. Thus it happened that, in the wars with the French, the English could act with more intelligence, speed, and force; for they were not hindered by partly civilized half-breeds. There was one disadvantage, however: the Indians became enemies of the English, and in the wars between the English and French most of them fought on the French side.

Finally, the fact that the English were hemmed in by forest-covered mountains on the west, and by the French and Spanish on the north and south, also proved an advantage. On that account, they were kept close together; and when wars arose, they were better able to combine their forces.

These are some of the chief reasons why the English-speaking race has won its way on the continent against both the Spanish and the French.

Review Questions

1. What is the influence of climate on plants and animals? 2. Describe the plants of the Far North. 3. What animals are found in the Far North? What can you tell about them? 4. What about the plant life in our western arid lands? 5. Describe the animal life in that region. 6. Describe the plant life in the temperate portion of North America outside of the arid lands. 7. Tell about the animal life in the same region. 8. What native plants and animals are likely to continue here long in the future? 9. What is the condition of plant life in the torrid zone? 10. Of animal life? 11. What was the condition of the Indians who formerly lived here? 12. Give several reasons why they did not become more powerful. 13. What portion of the continent was taken possession of by the Spaniards? 14. How did they treat the natives? 15. Give some reasons why they have not held their territory. 16. What portion of the continent was taken by the French, and why? 17. State some reasons why they have lost this territory. 18. Where were the earlier English settlements? 19. How much of the continent is now in control of English-speaking people? 20. Give some reasons for this remarkable fact.

Suggestions

1. Examine some century and cactus plants. 2. Find some furniture made of mahogany or other tropical wood. 3. Visit a greenhouse to see orchids. 4. Collect pictures of native plants and animals of North America. 5. Collect samples of different American woods.

III. THE UNITED STATES

1. General Facts

On Figure 9 we see that the United States occupies the central part of North America, extending from ocean to ocean.

Location and area

Aside from Alaska, which belongs to us, the only countries on our north are Canada, Newfoundland, and Greenland. On our south are Mexico and the several small countries of Central America. Trace our boundaries on the north and south. What portions are artificial? What portions natural? Is the distance across the United States greater from east to west, or from north to south? How much greater?

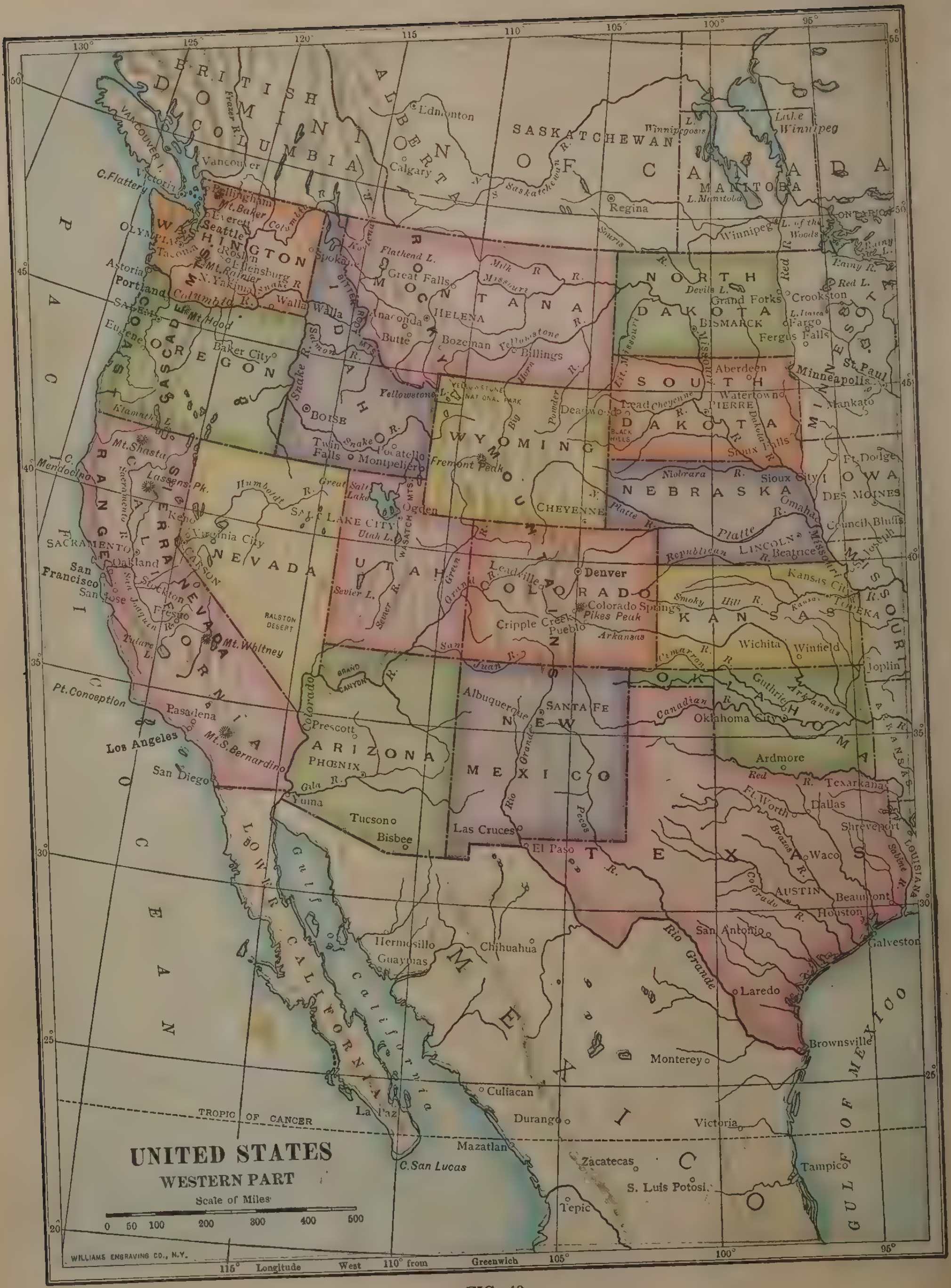

UNITED STATES
WESTERN PART
Scale of Miles
0 50 100 200 300 400 500
WILLIAMS ENGRAVING CO., N.Y.
115° Longitude West 110° from Greenwich 105°
130° 125° 120° 115 110° 105° 100° 95°
50 45 40 35 30 25 20 55
BRITISH COLUMBIA
DOMINION OF CANADA
ALBERTA
SASKATCHEWAN
MANITOBA
ONTARIO
Edmonton
Calgary
Vancouver
Victoria
Vancouver I.
Fraser R.
Saskatchewan R.
Regina
Winnipeg
L. Winnipegosis
Lake Winnipeg
L. Manitoba
L. of the Woods
Rainy L.
Rainy R.
Red L.
Souris R.
C. Flattery
PACIFIC OCEAN
WASHINGTON
Bellingham
Mt. Baker
Everett
Seattle
OLYMPIA
Tacoma
Roslyn
Ellensburg
Mt. Rainier
N. Yakima
Snake R.
Walla Walla
Columbia R.
Spokane
Astoria
Portland
SALEM
Mt. Hood
Eugene
OREGON
Baker City
Klamath L.
COAST RANGE
CASCADE MTS.
IDAHO
Salmon R.
BITTER ROOT MTS.
BOISE
Twin Falls
Montpelier
Pocatello
Yellowstone L.
MONTANA
Flathead L.
Great Falls
Milk R.
Missouri R.
HELENA
Anaconda
Butte
Bozeman
Billings
Yellowstone R.
Big Horn R.
Powder R.
ROCKY MOUNTAINS
YELLOWSTONE NATIONAL PARK
WYOMING
Fremont Peak
CHEYENNE
Deadwood
BLACK HILLS
Lead
NORTH DAKOTA
Devils L.
Grand Forks
BISMARCK
Fargo
Fergus Falls
Crookston
L. Itasca
Red R.
SOUTH DAKOTA
Aberdeen
Watertown
PIERRE
Cheyenne R.
Dakota R.
Sioux Falls
Lit. Missouri R.
MINNESOTA
Minneapolis
St. Paul
Mankato
IOWA
Ft. Dodge
Sioux City
DES MOINES
Council Bluffs
NEBRASKA
Niobrara R.
Platte R.
Omaha
LINCOLN
Beatrice
Republican R.
MISSOURI
St. Joseph
Kansas City
KANSAS
Smoky Hill R.
Kansas R.
TOPEKA
Wichita
Winfield
Cimarron R.
Joplin
NEVADA
Humboldt R.
Reno
Virginia City
CARSON
RALSTON DESERT
CALIFORNIA
SIERRA NEVADA
Mt. Shasta
Lassens Pk.
Sacramento R.
SACRAMENTO
Oakland
San Francisco
San Jose
Stockton
San Joaquin R.
Fresno
Mt. Whitney
Tulare L.
C. Mendocino
Pt. Conception
Pasadena
Los Angeles
Mt. S. Bernardino
San Diego
UTAH
Great Salt Lake
SALT LAKE CITY
Ogden
Utah L.
WASATCH MTS.
Sevier L.
Sevier R.
Green R.
Grand R.
COLORADO
Denver
Leadville
Colorado Springs
Pikes Peak
Cripple Creek
Pueblo
Arkansas R.
San Juan R.
ARIZONA
GRAND CANYON
Colorado R.
Prescott
PHOENIX
Gila R.
Yuma
Tucson
Bisbee
NEW MEXICO
Albuquerque
SANTA FE
Rio Grande
Pecos R.
Las Cruces
El Paso
OKLAHOMA
Canadian R.
Guthrie
Oklahoma City
Ardmore
ARKANSAS
TEXAS
Red R.
Texarkana
Ft. Worth
Dallas
Shreveport
Brazos R.
Waco
Colorado R.
AUSTIN
Beaumont
Houston
Galveston
San Antonio
Laredo
Brownsville
Sabine R.
LOUISIANA
MEXICO
LOWER CALIFORNIA
Gulf of California
Hermosillo
Guaymas
Chihuahua
Monterey
Culiacan
La Paz
C. San Lucas
Durango
Mazatlan
Zacatecas
S. Luis Potosi
Victoria
Tampico
Tepic
TROPIC OF CANCER
GULF OF MEXICO
100

FIG. 40.

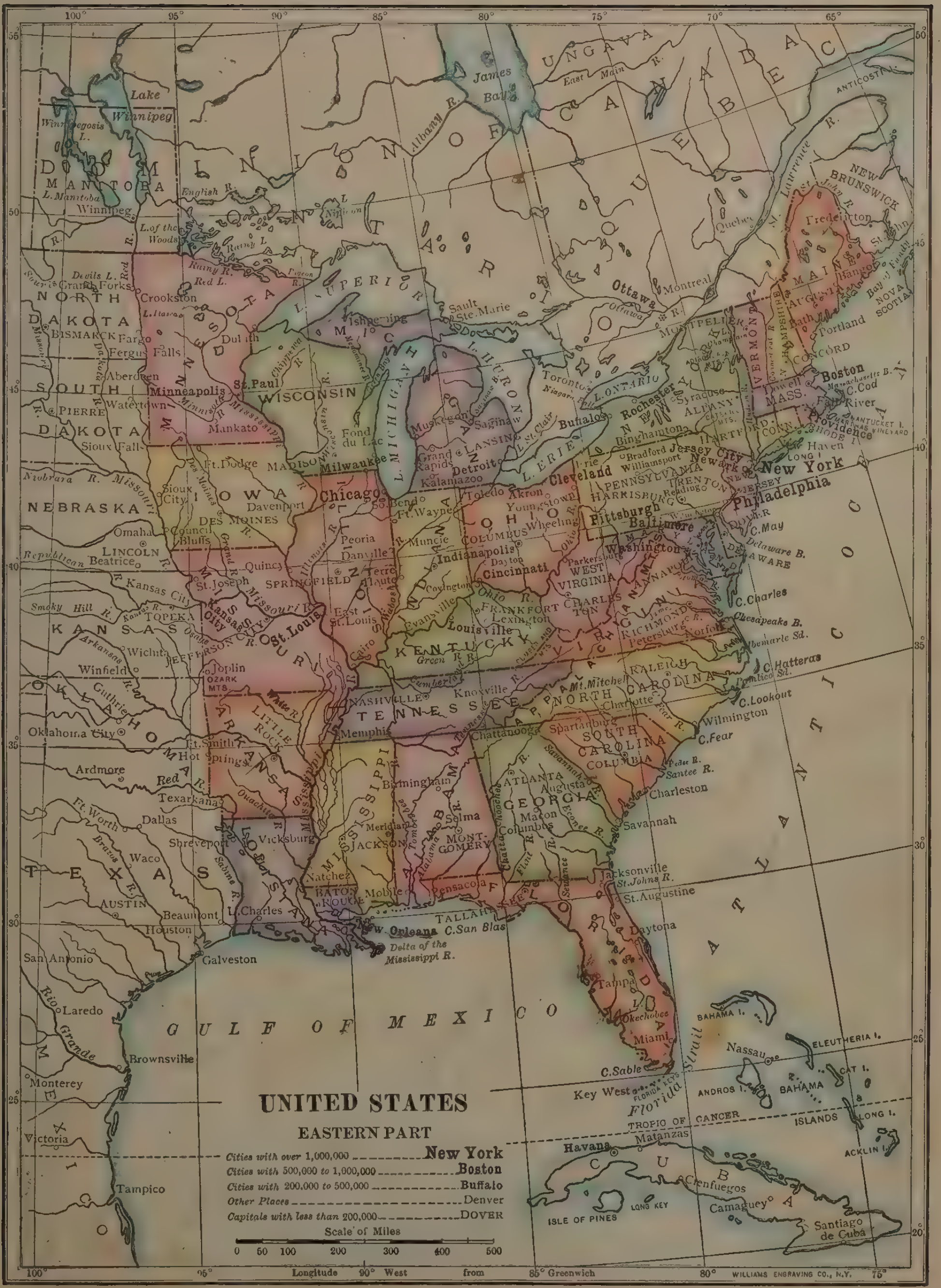

UNITED STATES
EASTERN PART
Cities with over 1,000,000 New York
Cities with 500,000 to 1,000,000 Boston
Cities with 200,000 to 500,000 Buffalo
Other Places Denver
Capitals with less than 200,000 DOVER
Scale of Miles
0 50 100 200 300 400 500
Longitude 90° West from 85° Greenwich
WILLIAMS ENGRAVING CO., N.Y.
DOMINION OF CANADA
QUEBEC
ONTARIO
UNGAVA
MANITOBA
James Bay
Lake Winnipeg
L. SUPERIOR
L. MICHIGAN
L. HURON
L. ERIE
L. ONTARIO
NORTH DAKOTA
SOUTH DAKOTA
NEBRASKA
KANSAS
OKLAHOMA
TEXAS
MINNESOTA
IOWA
MISSOURI
ARKANSAS
LOUISIANA
WISCONSIN
MICHIGAN
ILLINOIS
INDIANA
OHIO
KENTUCKY
TENNESSEE
MISSISSIPPI
ALABAMA
GEORGIA
FLORIDA
SOUTH CAROLINA
NORTH CAROLINA
VIRGINIA
WEST VIRGINIA
MARYLAND
DELAWARE
PENNSYLVANIA
NEW JERSEY
NEW YORK
CONN.
R. I.
MASS.
VERMONT
N. HAMPSHIRE
MAINE
NEW BRUNSWICK
NOVA SCOTIA
New York
Philadelphia
Chicago
Boston
St. Louis
Baltimore
Cleveland
Pittsburgh
Detroit
Buffalo
Washington
Cincinnati
New Orleans
Milwaukee
Minneapolis
St. Paul
Kansas City
Louisville
Indianapolis
Providence
Jersey City
Newark
Rochester
GULF OF MEXICO
ATLANTIC OCEAN
BAHAMA ISLANDS
CUBA
Havana
Florida Strait
TROPIC OF CANCER
MEXICO
APPALACHIAN MTS.

FIG. 40.

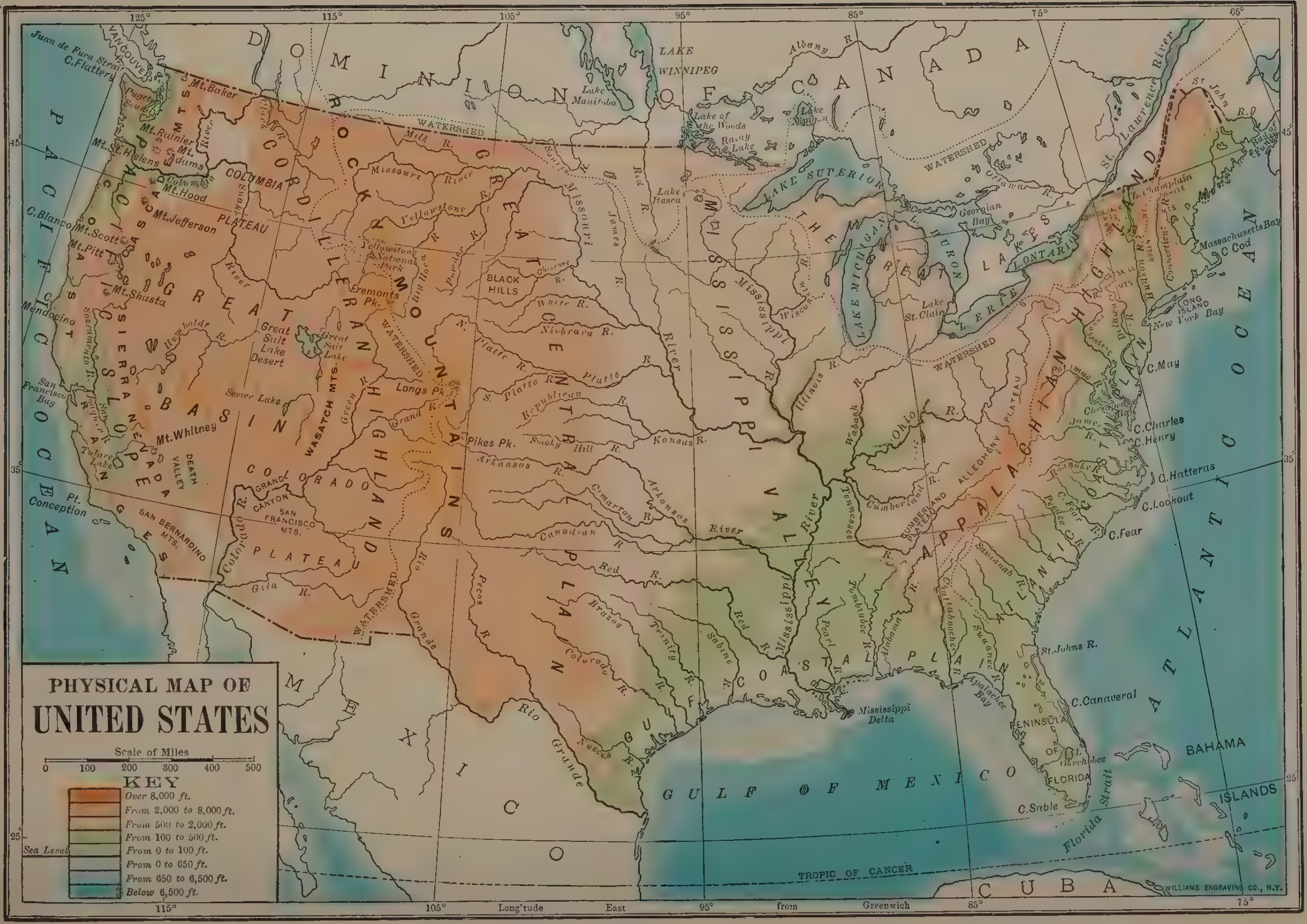

PHYSICAL MAP OF
UNITED STATES
Scale of Miles
0 100 200 300 400 500
KEY
Over 8,000 ft.
From 2,000 to 8,000 ft.
From 500 to 2,000 ft.
From 100 to 500 ft.
From 0 to 100 ft.
Sea Level
From 0 to 650 ft.
From 650 to 6,500 ft.
Below 6,500 ft.
DOMINION OF CANADA
PACIFIC OCEAN
ATLANTIC OCEAN
GULF OF MEXICO
MEXICO
CUBA
BAHAMA ISLANDS
ROCKY MOUNTAINS
CORDILLERAN HIGHLAND
GREAT BASIN
COLUMBIA PLATEAU
COLORADO PLATEAU
GREAT CENTRAL PLAIN
MISSISSIPPI VALLEY
THE GREAT LAKES
APPALACHIAN HIGHLAND
ATLANTIC COAST PLAIN
GULF COAST PLAIN
PACIFIC SLOPE
SIERRA NEVADA
CASCADE MTS.
WASATCH MTS.
SAN BERNARDINO MTS.
SAN FRANCISCO MTS.
BLACK HILLS
DEATH VALLEY
Great Salt Lake Desert
WATERSHED
TROPIC OF CANCER
Longitude East from Greenwich
125° 115° 105° 95° 85° 75° 65°
45° 35° 25°
WILLIAMS ENGRAVING CO., N.Y.

FIG. 41.

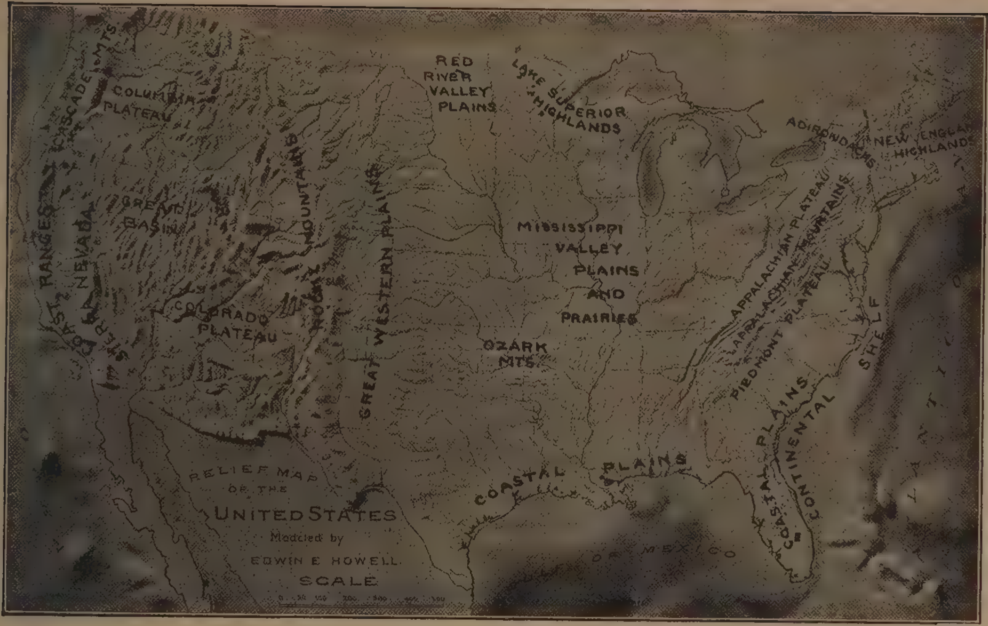


FIG. 42.—Relief map of the United States.

The area of the United States is about 3,000,000 square miles, which is more than four times the area of Mexico. Yet ours is not the largest country on the continent, for the area of Canada is greater than that of the United States and Alaska together.

Population and its distribution in 1790

Figure 43 shows the part of the United States that was settled before 1790, when George Washington was President for the first time. What states do you find that had no inhabitants other than Indians? Which had only scattered settlements, such as forts and small villages? Each of the cities shown on this map had a population of over 5000. What are their names? How about Chicago and St. Louis? All together there were only a little over 3,000,000 white men here at that time.

Our present population

Our present population is about 92,000,000. The present population of Canada is over 7,000,000, of Mexico about 15,000,000, and of Central America about 5,000,000. Not only have we more inhabitants than the other countries of North America combined, but we have more than all the countries of North and South America together. Ours has plainly been the favorite country for settlers in the New World.

Reasons for this rapid increase

This remarkably rapid increase in population has, to a large extent, been due to the number of foreigners who have come here to live.

1. Negroes

The early introduction of slavery has resulted in greatly increasing our numbers. There are now over 9,000,000 colored people in the United States, which is about one tenth of our entire population.

2. Immigrants from Europe and Asia

Europe and Asia have poured forth a steady stream of immigrants during the last one hundred years. Probably, in all, as many as 25,000,000 foreigners have come to our shores to live since 1790, and they are still coming at the rate of about a million a year. Nearly every foreign nation is represented, and upon the streets of our larger cities the languages of most of the civilized peoples of the globe may be heard.

The greater portion of our immigrants have come from northern Europe, especially from the British Isles, Germany, and the Scandinavian Peninsula; and many of them have settled in the cities. More recently a flood of immigration has come from southern Europe. At one time the Chinese began to come in great numbers, and laws preventing their coming had to be passed. We have laws, also, excluding paupers, criminals, diseased people, and laborers brought here by contract. To others the country is free.

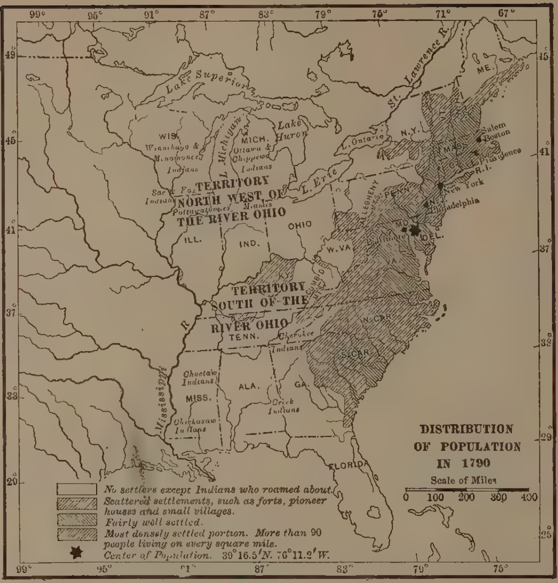

DISTRIBUTION OF POPULATION IN 1790
Scale of Miles
0 100 200 300 400
No settlers except Indians who roamed about.
Scattered settlements, such as forts, pioneer houses and small villages.
Fairly well settled.
Most densely settled portion. More than 90 people living on every square mile.
★ Center of Population. 39°16.5′N. 76°11.2′W.
TERRITORY NORTH WEST OF THE RIVER OHIO
TERRITORY SOUTH OF THE RIVER OHIO
Lake Superior
Lake Huron
L. Michigan
L. Erie
L. Ontario
St. Lawrence R.
Mississippi R.
WIS.
MICH.
ILL.
IND.
OHIO
W.VA.
TENN.
MISS.
ALA.
GA.
FLORIDA
N.Y.
ME.
Boston
Salem
Providence
New York
Philadelphia

FIG. 43.—Distribution of population in the United States in 1790.

Distribution of our population

Figure 44 shows the present distribution of our population. Where is the population most dense? Note that more than half of the whole country has, on the average, not more than twenty-five persons for each square mile. Point out this portion.

According to this map, which portion of North America has fewest settlers? What part of Canada is most densely populated? Of Mexico? Of Central America? Observe that the coast of the United States is most densely settled, while the coast of Mexico and Central America has few people, compared to the interior. Can you recall any explanation of this?

Reasons for such distribution

1. Immigrants came first to the East

It is natural that the eastern section of the United States should have been settled first, because most of the immigrants have come from Europe. Many of them, of course, have gone farther west, but many have remained in the great cities on the coast. Each large city there has its Italian quarter,

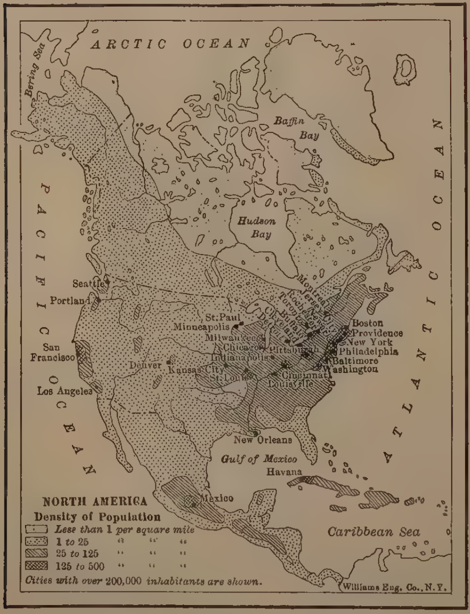


FIG. 44.—Density of population in North America at the present time.

its Russian quarter, its Jewish quarter, and so forth.

The transportation of goods is one of the great industries, and this business alone has attracted large numbers of people to certain points. The best shipping points, moreover, are often the best manufacturing centers, for people manufacture goods at those places where raw materials can easily reach them, and where finished articles can be shipped away cheaply in all directions. The excellent shipping points, therefore, attract people because of the manufacturing as well as the commerce; for these industries give them work to do.

2. Many people collect at the best shipping and manufacturing points

It is for these reasons that the fine harbors on our two coasts, and the best shipping centers on our interior water ways, have attracted the greatest number of people. On Figure 44 note the sections that have the densest population. Our eastern coast, from Boston southwest to Washington, has more great centers of population than any other equal area in North America. Name several of them. What great cities do you find along the Great Lakes and the Mississippi River and its larger tributaries? There is a dense population, also, about San Francisco Bay, as there is around New York Bay, and for a similar reason. Find other centers of dense population on the Pacific coast and in the interior.

The greatest industry of all is farming, about one third of all the men of the United States being engaged in that one occupation. That fact largely explains the presence of so many people in the Mississippi Valley.

3. Others are attracted to the best farming sections

(1) Extent of the Mississippi Valley

This broad trough between the mountain systems of the West and East is one of the most extensive fertile farming regions in the world. What is the length and breadth of this level region (Fig. 42)? There is only one mountainous section in this vast area, and that, called the Ozark Mountains in Missouri, extends also into Arkansas, Oklahoma, and Texas.

Not only is this fertile region very extensive, but the climate is favorable to many kinds of farm products. On Figure 40 find the latitude of New Orleans. Note that it is not very far from the Tropic of Cancer, which marks the northern boundary of the torrid zone. How near does Florida come to that zone?

(2) Its favorable climate

What is the latitude of our northern boundary? Observe how very far it is from that line to the Arctic Circle (Fig. 9), which marks the southern boundary of the frigid zone. It is plain not only that the United States lies in the temperate zone, but that it lies almost entirely in the southern half of that zone. That allows an abundance of heat in summer, even in the northern part of the Mississippi Valley. Thus the entire Mississippi Valley has a temperature that is very favorable to agriculture.

The rainfall is likewise favorable in most parts. Only far to the west of the Mississippi River, on the Great Western Plains (Fig. 42), is the quantity of rain too small for agriculture. From the Great Western Plains eastward to the Atlantic Ocean the rainfall is sufficient for good crops.

While the Mississippi Valley is the most extensive farming section in the United States, there is also much farming farther east and in the West. The favorable climate and good soil in the East, in the Mississippi Valley, and in parts of the West have helped greatly in attracting settlers.

Mining as well as manufacturing, commerce, and farming have attracted great numbers of people to the eastern half of the United States. Most of our hard coal is mined among the Appalachians of Pennsylvania. Most of our soft coal and iron ore, and much of our copper, also, are found east of the Mississippi River. These kinds of mining, therefore, increase the population in the East by many hundreds of thousands.

4. Others, still, are drawn to the mining and grazing sections

(1) Mining in the East

(2) *Mining in the West*

The mountainous section in the West, in which mining is important, is far more extensive than the Appalachians. This is the region of the Cordillera, mentioned on page 4. Beginning at the Pacific coast (Fig. 42), you see the mountains called the Coast Ranges, parts of which rise abruptly from the water's edge. Eastward from these are the Sierra Nevada and Cascade Ranges, in which there are many lofty peaks. Farther east are the Rocky Mountains, which extend entirely across the United States, into Canada and Alaska on the north, and far into Mexico on the south. Extensive plateaus, with short mountain ranges, lie between the Rocky Mountains and the Sierra Nevada-Cascade Ranges. Find the names of the two principal plateaus on Figure 42.

There are many mines in this section, but they are scattered over the vast territory. The precious metals, and much copper and other metals are found there; but far less coal and iron ore are mined in the West than in the Appalachians. The mining industry, therefore, has brought a much smaller and more scattered population to the Cordillera.

(3) *Grazing in the West*

In much of the western half of the United States grazing is the leading industry. That calls for a very small population, for reasons that you can give. Over wide areas grazing is the only industry, because much of the land is arid or desert. Find the Great Basin (Fig. 42), which is mainly desert. The reason for so dry a climate is that the principal winds for this region blow from the Pacific; and, since they lose most of their moisture on the high mountains, the lowlands and plateaus between the mountain ranges suffer from drought.

Figure 44 shows most of the western half of our country to be very thinly settled, but there are several places that have a dense population. Point them out. The special reasons why so many people have settled at these points you will learn later.

Reason for studying the United States in sections

Our country is so large that it is necessary to divide it into sections in order to study it in proper detail. Accordingly, the states have been grouped into five sections, of which the first is the New England Group. The others, in their order, are the Middle Atlantic States, the Southern States, the Central States, and the Western States.

Importance of watching the scale of maps

As you study each of these sections, a very important point to notice is the *scale* upon which each map is drawn. For example, in Figure 45, an inch and a half represents about one hundred miles. According to that scale, how long is the state of Connecticut? Find what the scale is on the map, Figure 64. Using that scale, find the distance from New York to Buffalo. Using both maps, find the distance from Philadelphia to Boston, by way of New York. When studying a map, whether in this book, on the wall, or in an atlas, it is always important to first observe its scale.

Review Questions

1. State the location and area of the United States. 2. What was our population and its distribution in 1790? 3. What is our present population, and how does it compare with that of other countries in the New World? 4. How many colored people are there in the United States? 5. What immigrants are allowed to come here? How many have come, in all? 6. What is the present distribution of the population of North America? 7. Show why the place where the immigrants land is one reason for so great a population on our eastern coast. 8. Explain the influence of our best shipping and manufacturing points on the distribution of our people. 9. What farming sections have attracted great numbers of people? Give reasons. 10. How has mining affected the population in the East? 11. Why is the western half of the United States so thinly settled? 12. Show, by an example, that it is important when studying maps to observe the scale.

Suggestions

1. Can you tell why Florida is so thinly settled? 2. Show the dangers that we run, in receiving so many immigrants. 3. What reasons can you give for forbidding Chinese immigration? 4. What objection do you see to allowing an Italian quarter, a Chinese quarter, etc., in our large cities?

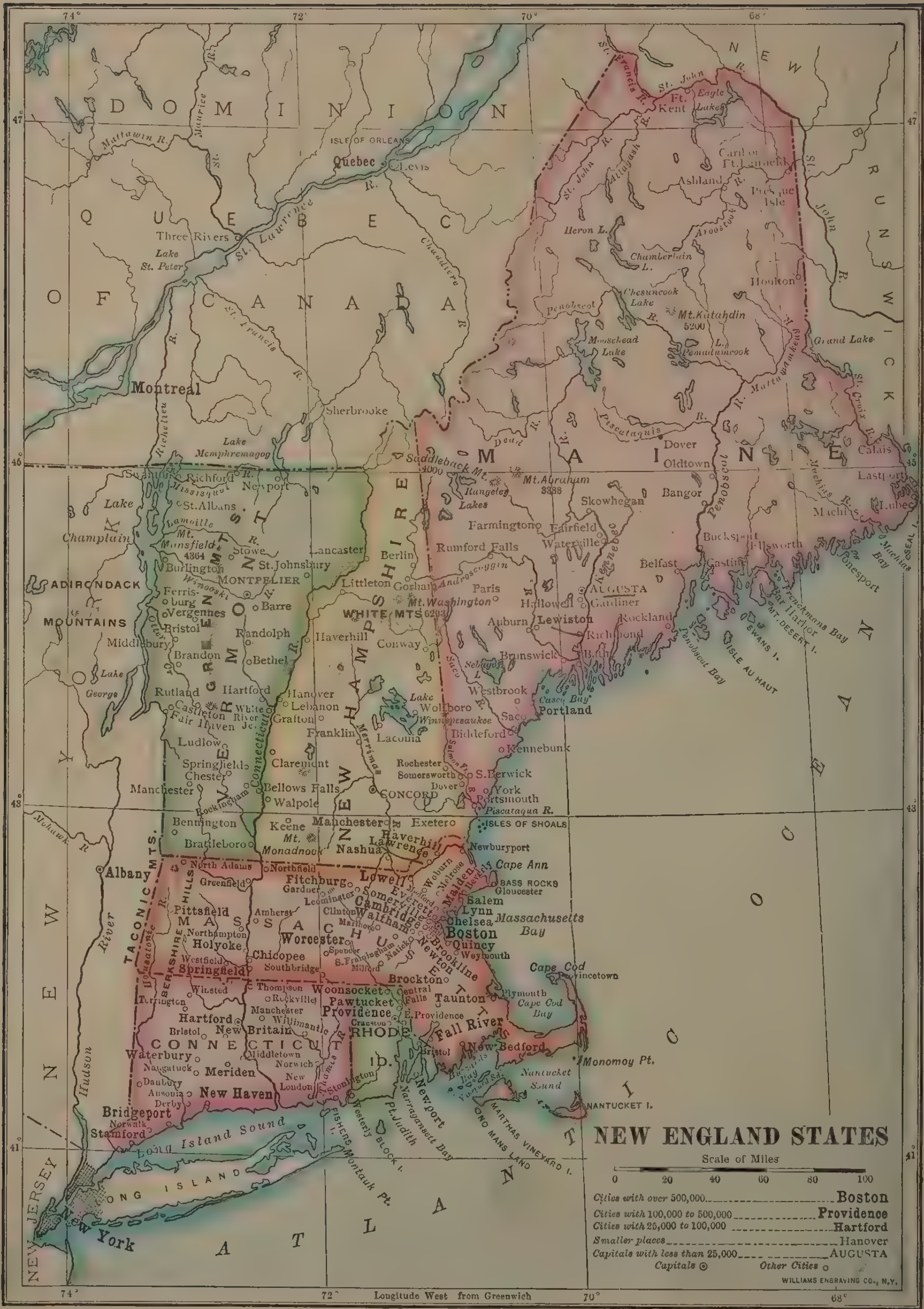

NEW ENGLAND STATES
Scale of Miles
0 20 40 60 80 100
Cities with over 500,000 Boston
Cities with 100,000 to 500,000 Providence
Cities with 25,000 to 100,000 Hartford
Smaller places Hanover
Capitals with less than 25,000 AUGUSTA
Capitals ⊙ Other Cities ○
WILLIAMS ENGRAVING CO., N.Y.
Longitude West from Greenwich
74° 72° 70° 68°
47 45 43 41
DOMINION OF CANADA
QUEBEC
NEW BRUNSWICK
NEW YORK
NEW JERSEY
MAINE
NEW HAMPSHIRE
VERMONT
MASSACHUSETTS
RHODE ID.
CONNECTICUT
ATLANTIC OCEAN
Quebec
Levis
Isle of Orleans
Three Rivers
Lake St. Peter
St. Lawrence R.
Montreal
Sherbrooke
Lake Memphremagog
Lake Champlain
ADIRONDACK MOUNTAINS
Lake George
Albany
Hudson River
Mohawk R.
Long Island Sound
LONG ISLAND
New York
Montauk Pt.
Block I.
Fishers I.
Mt. Katahdin 5200
Moosehead Lake
Chesuncook Lake
Chamberlain L.
Heron L.
Ft. Kent
Eagle Lake
Ashland
Presque Isle
Houlton
Grand Lake
Calais
Eastport
Lubec
Machias
Dover
Oldtown
Bangor
Skowhegan
Farmington
Fairfield
Waterville
Rumford Falls
Augusta
Gardiner
Hallowell
Lewiston
Auburn
Rockland
Belfast
Castine
Bucksport
Ellsworth
Bar Harbor
Mt. Desert I.
Isle au Haut
Penobscot Bay
Brunswick
Bath
Richmond
Westbrook
Portland
Casco Bay
Saco
Biddeford
Kennebunk
S. Berwick
York
Portsmouth
Isles of Shoals
Mt. Abraham 3388
Saddleback Mt. 4000
Rangeley Lakes
Mt. Washington 6293
WHITE MTS.
Berlin
Gorham
Lancaster
Littleton
Conway
Haverhill
Hanover
Lebanon
Lake Winnipesaukee
Wolfboro
Laconia
Franklin
Claremont
Concord
Rochester
Somersworth
Dover
Manchester
Exeter
Nashua
Keene
Mt. Monadnock
Walpole
Bellows Falls
Newport
Richford
St. Albans
Swanton
Mt. Mansfield 4364
Stowe
St. Johnsbury
Burlington
Montpelier
Barre
Vergennes
Ferrisburg
Bristol
Middlebury
Randolph
Bethel
Brandon
Rutland
Castleton
Fair Haven
White River Jc.
Hartford
Grafton
Ludlow
Springfield
Chester
Manchester
Bennington
Brattleboro
Rockingham
GREEN MTS.
TACONIC MTS.
BERKSHIRE HILLS
North Adams
Greenfield
Northfield
Pittsfield
Northampton
Holyoke
Westfield
Springfield
Chicopee
Amherst
Fitchburg
Gardner
Leominster
Clinton
Worcester
Southbridge
Spencer
Lowell
Lawrence
Haverhill
Newburyport
Cape Ann
Bass Rocks
Gloucester
Salem
Lynn
Malden
Chelsea
Everett
Somerville
Cambridge
Waltham
Newton
Brookline
Boston
Quincy
Weymouth
Massachusetts Bay
Brockton
Taunton
Plymouth
Cape Cod Bay
Cape Cod
Provincetown
Fall River
New Bedford
Monomoy Pt.
Nantucket Sound
Nantucket I.
Martha's Vineyard I.
No Mans Land
Woonsocket
Pawtucket
Central Falls
Providence
E. Providence
Cranston
Bristol
Newport
Narragansett Bay
Pt. Judith
Westerly
Stonington
Thompson
Rockville
Manchester
Willimantic
Hartford
New Britain
Bristol
Winsted
Torrington
Waterbury
Naugatuck
Meriden
Middletown
Norwich
New London
New Haven
Danbury
Ansonia
Derby
Bridgeport
Norwalk
Stamford

FIG. 45.

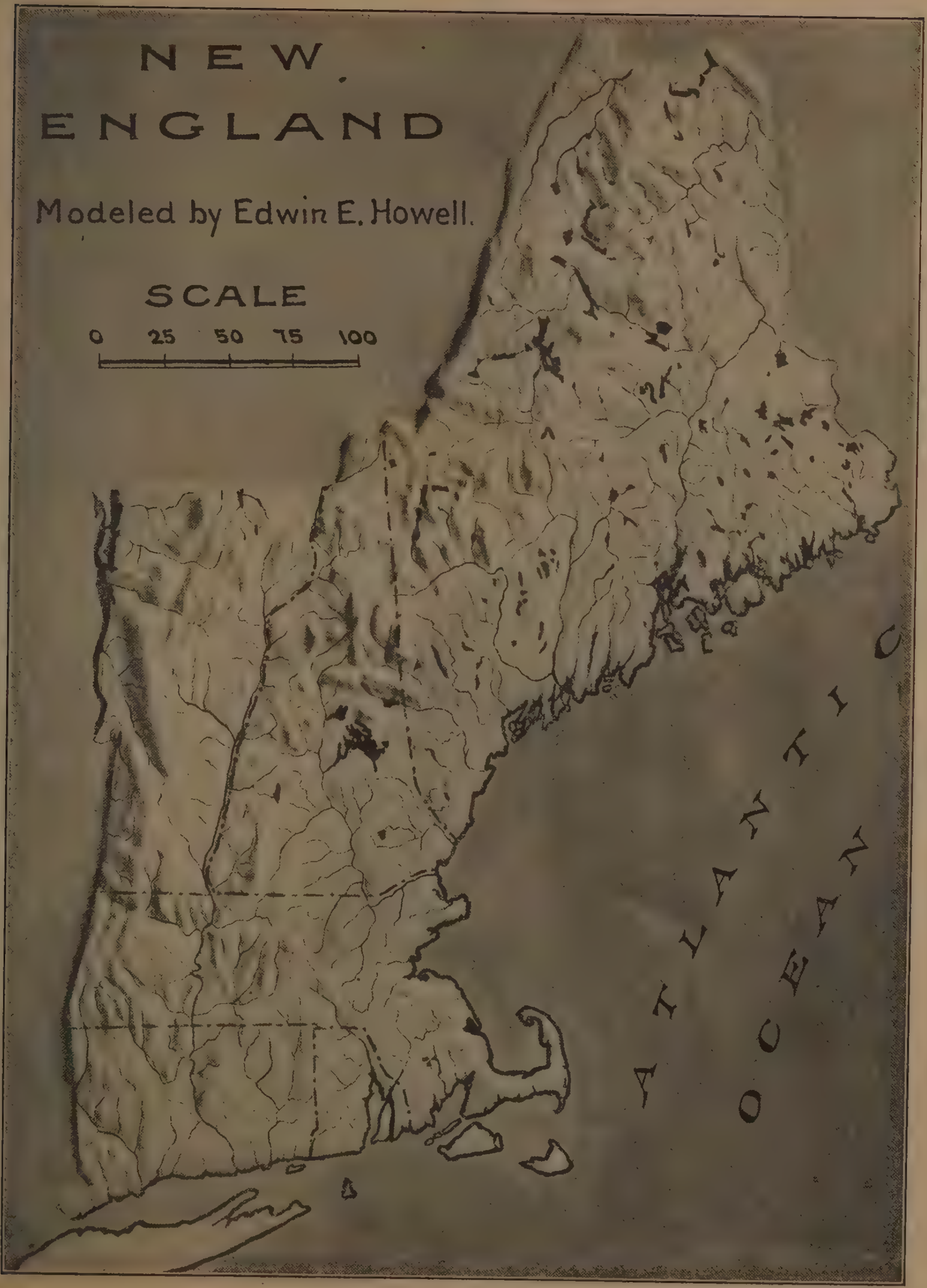


FIG. 46.—Relief map of New England.

2. New England

Map Study

1. Name the states of this group. 2. What is the capital of each? 3. Where are the mountains? 4. Into what bay does the Penobscot River flow? 5. What large island lies just east of it? 6. Find three large lakes. In which state is each? 7. Name and locate several of the largest cities. 8. What cape is about twenty-five miles north of Boston? 9. What cape is southeast of Boston? 10. Find Massachusetts Bay. 11. Find Cape Cod Bay. 12. What two large islands lie southeast of Massachusetts? 13. What two bays are near them? 14. What large island lies south of Connecticut? 15. In what state is it (Fig. 64)? 16. What waters separate it from Connecticut? 17. Name the three largest rivers of Maine; the largest one in New Hampshire; the two largest in Connecticut. Trace the course of each.

Reasons for its irregular surface

1. The mountains

Since the Appalachian Mountains extend across New England, most of its surface is either hilly or mountainous. Near the coast the hills are low, but the land gradually rises toward the interior until it becomes a low plateau. This plateau is crossed by river valleys that cut into it in every direction. The valleys are usually several hundred feet deep, with steep sides, so that the surface there is very irregular.

In the western and northern parts of New England, the surface becomes quite mountainous (Fig. 47). There are some peaks, like Mount Monadnock in southern New Hampshire, that rise singly above the plateau upland; but others are found in groups, or clusters, as the White Mountains of northern New Hampshire, for example. Still other mountains are grouped in irregular ranges, of which the Green Mountains of Vermont, and the Taconic Mountains and Berkshire Hills of western Massachusetts, are examples.

Many of the mountain peaks rise three or four thousand feet above sea level; but Mount Washington, in the White Mountains, has an elevation of over a mile, and Mount Katahdin, in Maine, is nearly as high. In Figure 45 find the various mountain peaks and ranges named.

2. The Great Glacier

On page 7 you learned that the Great Glacier made many changes in our country. This glacier extended over the whole of New England, and for a long time its front rested on the islands just south of this group of states. Indeed, Cape Cod, Martha's Vineyard, Nantucket, and Long Island are made in part of moraine hills and sandy plains that were built in front of the vast ice sheet.

As the ice melted away toward the north, it left moraines and other deposits farther north. Some of these dammed up the

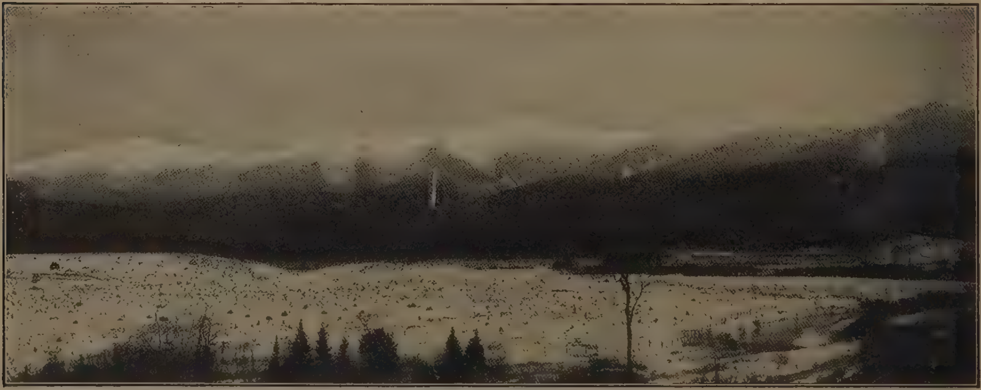


FIG. 47. — A view of the White Mountains of New Hampshire.

streams and formed the many lakes that dot the surface of New England. Others turned the streams from their courses, and caused their waters to tumble in many rapids and falls. Besides this, the glacier plowed away the soil from many hill slopes, leaving bare rock ledges. It also carried much rock into the valleys and on to the lower hilly land. It was in this way that much of the farm land became strewn with bowlders, as shown in Figure 23.

3. The sinking of the coast

The sinking of the coast has given New England a very irregular outline. What have you already learned about this (p. 11)? Name some of the larger capes, bays, and islands that were thus formed.

The mountain rocks of New England are mostly hard, including many granites. Where the sinking of the land has lowered these into the sea, the beating of the waves has removed the soil and exposed the bare rock. This is why so much of the irregular coast is rock bound, and has such grand scenery.

The climate

Maine does not reach quite so far north as do several of our Western States. Name them (Fig. 40). Yet this section lies far enough north to have a rather severe climate; and a cold ocean current near the coast makes the climate somewhat cooler than it would otherwise be. This is called the Labrador current, because it flows past the Labrador coast. It is a slowly moving stream of ocean water, many miles wide, that begins in the Arctic Ocean and flows southward along the coast of Nova Scotia and New England as far as Cape Cod (p. 222).

On the other hand, there is a current of warm water that makes the southern portion of New England warmer than it would otherwise be. This current, called the Gulf Stream, comes from the Gulf of Mexico and flows northeast, out into the Atlantic Ocean (Fig. 312). East of New England it is much farther from land than the Labrador current.

The prevailing winds in New England blow from the west. Every few days, however, the direction of the wind changes to the east or south, and the air then comes from the ocean, often bringing rain. The winds that blow from the east and northeast are cool in summer and very chilly in winter, since they are cooled in passing over the Labrador current. They often cause heavy snows in winter, and rain and fog in summer. Those winds that blow from the south, on the other hand, are warmed in passing over the Gulf Stream. Largely for that reason, the southern part of New England is much warmer, and has little snow in winter.

Lumbering

1. Extent of the forests

In the days of the early settlers, most of New England was covered with forests, and one of the first products sent back to England was lumber. Now the woods have been cleared away from much of the land, but where it is too steep or rocky for farming, large tracts of forest still remain.

For instance, there are large tracts of land in northern Maine, New Hampshire (Fig. 48), and Vermont, as well as in parts of the three southern states, that are still covered with timber. Standing on the summit of Mount Katahdin, one sees only a vast wilderness of trees in all directions. The nearest cultivated land is twenty-five miles to the east, while the unbroken forest stretches much farther away to the north and west.

2. Cutting of the timber

Winter is the busy season for cutting timber in this wilderness, for the swamps, which are numerous, and in summer impassable, are then frozen. At that season, also, the snows have covered the bowlders and fallen trees, and made the surface level enough for sleds, loaded with logs, to be drawn through the woods.

Usually fifty or more men are necessary to a logging camp. With axes in hand, they go through the woods chopping down all the trees that are large and sound enough for good lumber. The limbs are then chopped off, and the logs are dragged by horses to the banks of the nearest stream (Fig. 49).

3. Floating the logs to the mills

When the snow melts in the spring, the cutting is over and another busy season begins. The ice on the rivers breaks up, the streams are swollen by the melting snows, and the logs are whirled off downstream in the swift current. Frequently, however, even this flood of water is not sufficient to carry them. In such cases, in order to provide more water, dams are placed across the streams, or at the outlet of lakes. When more water is needed, the dams are opened, and a flood is poured into the stream. In this way immense numbers of logs are floated, or "driven" downstream, forming what the lumbermen call a "log drive."

FIG. 48. — A forest-covered mountain slope in the New Hampshire mountains, where a large part of the surface is still occupied by forest.

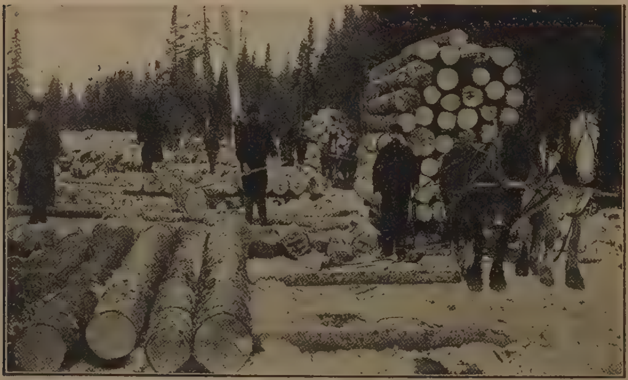


FIG. 49. — Lumbermen at work in winter, drawing the logs on sleds to the edge of the stream.

The work of driving the logs is a very exciting one. The logs often run on to rocks and shoals; and, as soon as one gets caught, others are held back by it. If the "jam" is not speedily removed, the entire stream may become blocked. Such a condition is called a *log jam* (Fig. 50), and it is the business of the log drivers to prevent jams by freeing the logs that become thus lodged.

Some of the logs are stopped near waterfalls, far upstream, where they are sawed into boards, laths, shingles, etc.; but most of them are carried to sawmills as far down the river as the current will take them.

4. Hardships of the lumberman's life

During the season for cutting, the men go forth early in the morning and work until late in the evening, eating and sleeping in log cabins (Fig. 51). Their beds are broad shelves of rough boards, covered with boughs from the spruce and balsam trees; and the camp is often so small that they must lie side by side, with scarcely room to turn. There is much exposure, too. The men may suffer

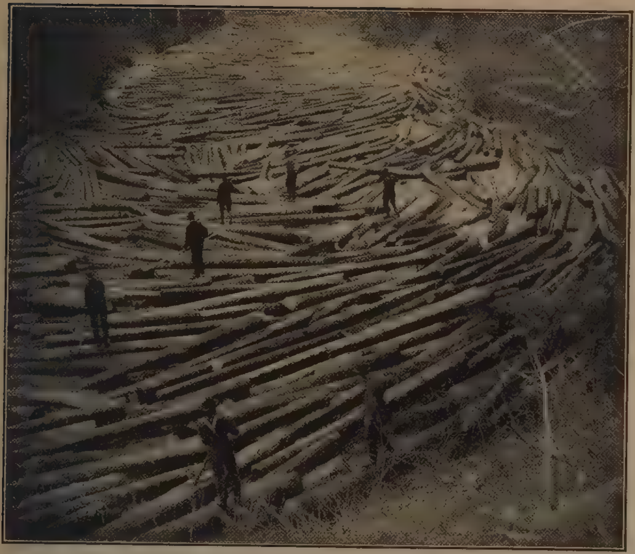


FIG. 50. — A log jam in a stream in which the logs are being floated from the forest. The lumbermen are at work trying to start the logs moving again.

seriously from the cold, for it is often necessary to work when the temperature is far below zero.

The work of preventing log jams brings even more exposure, for the workmen must frequently wade into the icy water and ride upon the logs. One may often see a man carried along on a single log, clinging to it by means of the sharp spikes in his boots, and balancing himself with a long pole. Now and then he must jump from log to log, as a squirrel springs from tree to tree. In this way the men are often wet from head to foot, and may even be thrown into the water and drowned. So many hardships are connected with lumbering, that a lumberman is said to become an old man after a few years of service.

5. Value of the forest

The forests of New England supply much lumber, though far less than formerly. Woods have another important use: they prevent the rain water from running rapidly off the land. Where the forest has been carelessly destroyed by the lumbermen, or by fire, the streams rise rapidly after every rain and then quickly decrease in size. Often there is not enough water to run the factories that use the water power. Thus it becomes very important to preserve the forest, and the government is planning to set aside large areas, at the head waters of the streams, as forest reservations.

Quarrying

New England produces very little metal, and no coal. There are, however, some valuable mineral products, such as clays for making bricks, and stone used mainly for building. Among the building stones three kinds are of especial value; namely, granite, marble, and slate, each of which is quarried in large quantities.

Many of the hills, and even mountains, such as Mounts Washington and Katahdin,

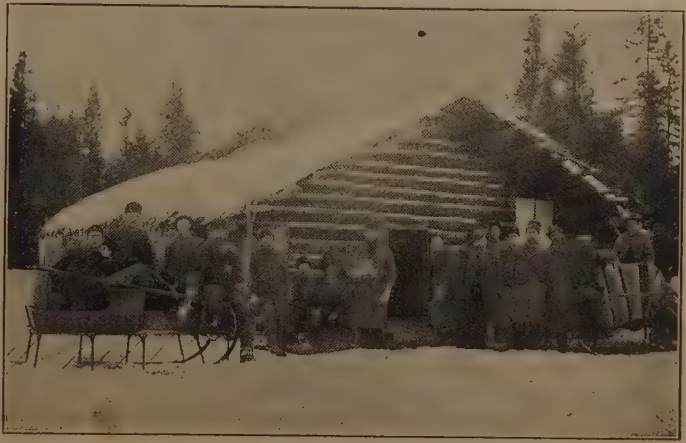


FIG. 51. — Lumbermen and their log cabin in the woods of Maine.

are made mainly of granite. But this is not often quarried, because it is too difficult to draw the heavy stone to places where it is needed. The quarries have generally been opened or developed either close to cities, or else near the sea, where the stone may be cheaply shipped.

1. Granite
(1) *Where found and quarried*

One of the oldest stone quarries in the country is at QUINCY, near Boston (Fig. 45). Buildings made of Quincy granite over two hundred years ago may still be seen in Boston. Other quarries are found in and near GLOUCESTER and MILFORD, Mass.; WESTERLY, R.I.; BARRE, Vt.; CONCORD, N.H.; and at several points along the Maine coast.

(2) *Uses*

Much of the granite is used for paving stones in the city streets, where heavy wagons pass. For that purpose large blocks are split into smaller ones of the proper size.

Many of the large blocks are carried by boat to Boston, New York, or even as far as New Orleans, where they are used for curbstones, for building, and for other purposes. Some of the government buildings at Washington are made of New England granite. Another important use of granite is for monuments, columns, and other ornamental work. The stone is well suited for this purpose because of its beautiful color, which varies in different quarries. Some granites are gray, others almost white, bluish, or distinctly red; and most kinds will take a high polish.

2. Marble
(1) *Where quarried*

The most noted marble quarries in the United States are near RUTLAND, Vt. (Fig. 52), where much of the stone is white, though some of it is streaked with blue. In other places in Vermont the colors of the marble are quite different, and often very beautiful.

(2) *Uses*

This stone is too soft for paving stones, but it is much used for buildings, statues, and monuments. Indeed, the Rutland marble is one of the most common headstones in the cemeteries of the Eastern States. Like granite, it may be given a high polish.

Some of the most highly prized marble, mostly obtained from foreign countries, is so banded and mottled that, when polished, it makes a beautiful ornamental stone for interiors of churches and other buildings. White marble has been used for many centuries as building material. In fact, long before the time of Christ, the Greeks built the marble Parthenon upon the Acropolis of Athens (Fig. 454). They also chiseled out marble statues, such as that of the Venus of Milo, which have become famous on account of their beauty.

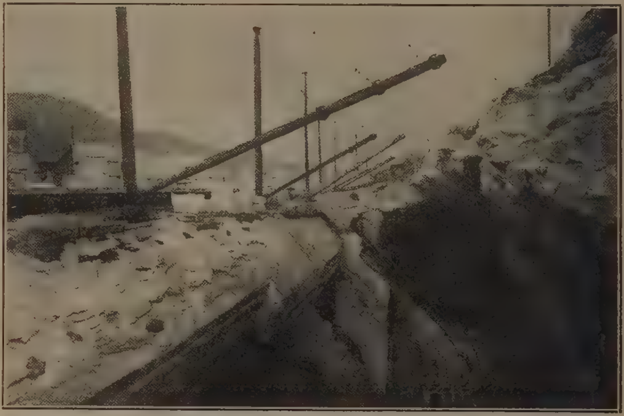


FIG. 52.—One of the marble quarries near Rutland, Vt. The stone is quarried out in the deep pit on the right, and the blocks are hoisted to the surface by the derricks.

3. Slate

Slate rock is quarried in several parts of New England, as in eastern Maine and western Massachusetts and Vermont. The value of slate is due largely to the fact that it splits, or *cleaves*, so easily that it is readily broken into thin slabs with a smooth surface. In this way it is made into roofing slate and school slates; from it are also made blackboards, slabs for wash basins, and stone for use in the interior of buildings.

Still another raw product of New England is fish. When the country was first settled, great numbers of various kinds, especially mackerel, halibut, and cod, were found close to the shore. Such names as Cape Cod, Halibut Point, Lobster Cove, and Bass Rocks, given to places on the New England coast, indicate this. Find the first of these.

Fishing

1. Former abundance of fish

Fish supplied the early settlers with one of their chief foods, and the fishing industry soon became important. You will remember (p. 25) that it was the fishing which early attracted the French to the American coast, and they still retain the right to fish along the Newfoundland shore.

2. Centers of the fishing industry

Fish are now much less abundant near the coast, but since they are still found farther from the shore, hundreds of vessels, and thousands of men, are engaged solely in catching them. GLOUCESTER, which is a center for that industry, is the most noted fishing port in the United States; but BOSTON, PORTLAND, and PROVINCETOWN also have an important fish trade. Locate each.

3. Mackerel

Most of the mackerel are caught in spring and summer. They swim together, on the surface of the ocean, in such numbers, or *schools*, as fishermen say, that they may be easily seen from a distance. The fishermen who cruise about in search of the mackerel sail in swift, two-masted vessels, called *schooners* (Fig. 53). When they see a "school," they spring into their great seine boats, row over to the fish, drop a large net, or *seine*, into the water, and draw it around the "school." Then the seine is drawn in, forming a pocket and trapping the fish. In this pocket enough fish are sometimes caught to fill hundreds of barrels. Some of the fish are taken to port to be sold fresh, but most are salted. This method of fishing is similar to that which the Disciples of Christ used in the Sea of Galilee.

4. Halibut and codfish

(1) *Where caught*

Halibut and cod cannot be caught with a seine, for instead of swimming at the surface, these fish live on the sea bottom. They are caught in winter as well as summer, mainly on the Fishing Banks that lie off the coasts of New England and Newfoundland. Some of the Gloucester fishing vessels, however, go as far as Greenland and Iceland for halibut and codfish.

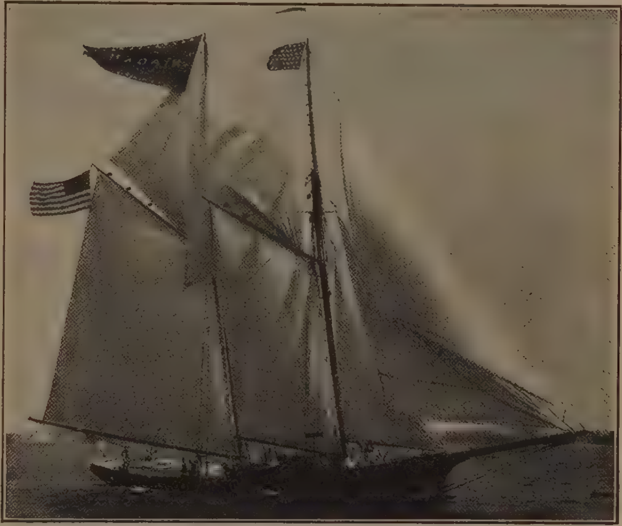


FIG. 53.—A Gloucester fishing schooner, just leaving port on a fishing trip.

(2) *Method of catching*

Halibut are very large, some weighing more than a man, and they are often caught upon single lines. Codfish may be caught in the same manner, though a *trawl* (Fig. 54) is more commonly used for cod than for halibut. The trawl consists of a number of hooks hanging from a single long line, all lowered into the water together and left there for hours. The fish swallow the bait on the hooks, and in this way many are caught at one time.

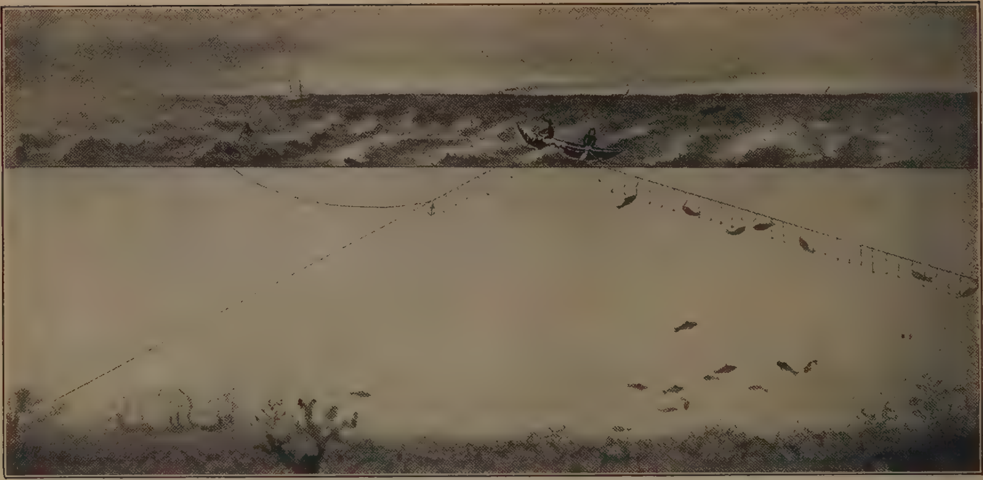


FIG. 54.—Fishermen drawing up a trawl on the Fishing Banks of Newfoundland. The long line, with shorter ones hanging from it, with hooks on their ends, is lowered to the bottom. After a while it is drawn up and the fish that are on the hooks are taken into the boat.

(3) *Danger of such fishing*

This kind of fishing is dangerous, because the men must venture out in small, flat-bottomed boats, called *dories*, to take the fish off the trawls. While they are busy fishing, a storm may arise, or a heavy fog come up, and prevent their return to the vessel. They are then left in open boats far out upon the ocean. Every year dozens of Gloucester fishermen are lost in this manner.

(4) *Method of marketing*

As in the case of mackerel, codfish are sold either fresh or salt; but most of the halibut are sold fresh, though some are smoked. In order to salt, or *cure*, the codfish, they are split open and cleaned, soaked in barrels of brine, and then dried upon the wharf. Very often the bones are removed, the skin stripped off, and the flesh torn into shreds and packed into boxes as boneless cod. Either the salted or boneless cod may be seen in almost any grocery, and much of it comes from Gloucester.

5. Other ocean foods

Traps, or *weirs*, are also set for fish. They are placed along the shore, and many kinds of fish, such as shad, salmon, and bass, swim into them and are then unable to find their way out. Another kind of fish that is caught on the New England coast is the herring, which is smoked and canned in large quantities at EASTPORT, Me.

Lobster fishing is also carried on, especially on the coast of Maine. A lobster trap, made of wood and weighted with stone, is lowered to the bottom, where the lobster lives, crawling around among the rocks and seaweed. A fish-head for bait is inside the trap, and the lobster crawls in to get it; but he is so stupid that he is rarely able to find his way out.

Clams, found along many parts of the New England coast, live buried in the mud flats which are exposed to view at low tide. At such times boys and men dig these shellfish out, much as a farmer digs potatoes. Another kind of shellfish on the New England coast is the *scallop;* and still another is the *oyster*, which thrives in the shallow water of the bays on the southern coast of New England.

Agriculture

1. Importance of this industry

So much of New England is hilly or mountainous, and the soil is so strewn with bowlders, that farming is not so extensive an industry as in many other parts of the country. In some sections, where the soil is very poor and no market is near, farming has proved such a failure that many farms have been abandoned (Fig. 55). On these, the orchards are grown up with weeds, and the houses and barns are tumbling down. This is especially true in the more hilly parts of New England.

On the other hand, there are some sections where there is really excellent farm land. This is true in the larger valleys, particularly the Connecticut Valley, which has much level and fertile land.

2. Products from the farms

Each farm usually has a small orchard and also produces hay and grain, which are either fed to cattle and horses, or sold. All the farmers keep some poultry, selling the chickens and eggs; and some make a business of *raising poultry*, such as hens, turkeys, and ducks.

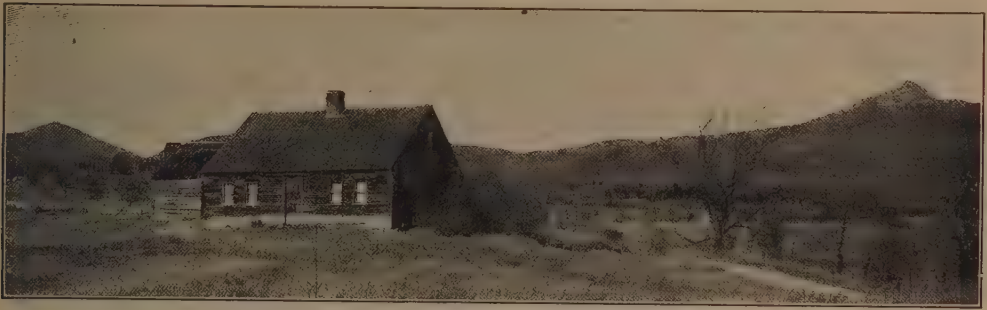


FIG. 55. — An abandoned farm in the hilly part of New England where the soil is thin and sterile.

A very common occupation is *truck farming*. On truck farms various kinds of vegetables, like tomatoes, sweet corn, potatoes, cucumbers, cabbages, and celery, are carefully cultivated; and these, together with milk and eggs, are sent to the nearest town to be sold. The farmer often takes them to town himself and sells them from house to house, thus securing higher prices than if he sold them to a storekeeper. Why?

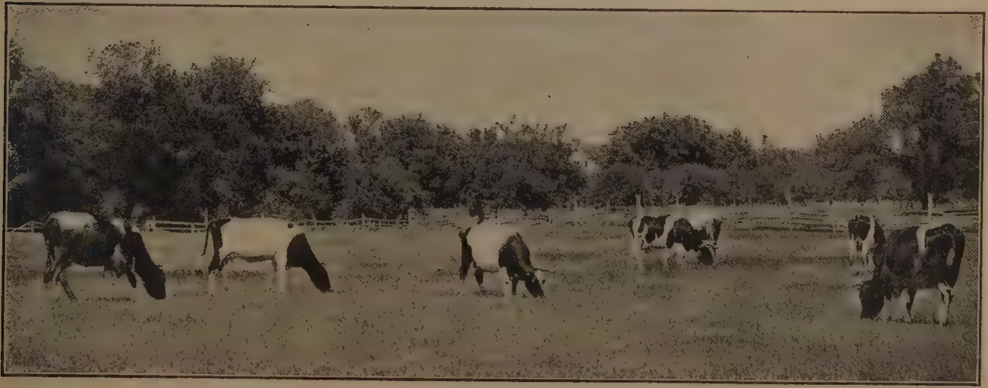


FIG. 56. — A herd of dairy cows grazing in the pasture. Their milk is sent to the cities.

Where the farms are so far away from the cities that it is impossible to drive to market, *dairying* is common (Fig. 56). So much milk is needed in the large cities that special arrangements are made for marketing it. Special cars, and even whole trains, carrying nothing but cans of milk, are run to them from far out in the country. A great deal of milk is made into butter and cheese, sometimes on the farm, but much more commonly at *creameries*, where the work is done by machinery.

In the Connecticut Valley, the farms are often of good size, having fields of grain and fine large gardens and orchards. There are also extensive fields of tobacco.

3. The market for such products

Strangers traveling through New England, upon seeing the hilly surface and rocky soil, are often puzzled to understand how the farmers can earn enough to build such large houses and barns, to furnish their homes so well, and to have so many books and pictures. The reason is that the cities, near at hand, give an excellent market for farm products. There are so many people in these states, especially in the three southern ones, that only a part of the food needed can be raised in this section. This insures a ready and profitable market for whatever food the land can produce.

Manufacturing

1. Extent of this industry, with reasons

When the Puritans settled New England, the articles that they needed had to be brought across the ocean at great expense. At first they imported not only furniture and tools, but even wood for the interior of houses, and bricks for the walls, fireplaces, and chimneys. Even now, in some of the older New England houses, one sees doors and rafters that came from over the sea long ago.

Very soon, however, the settlers began to make such articles as shoes, cloth, and lumber. Thus manufacturing began early, and the industry was greatly aided by the water power (Fig. 57). It was also aided by the many lakes. These served as reservoirs from which the falls and rapids were supplied with water, even during times of drought. Many mills and factories sprang up near the coast, and later in the interior.

Thus New England soon became the principal manufacturing section of the whole country. To-day its many large cities owe their growth chiefly to this industry. Hundreds of articles are made, of which those composed of wood, cotton, wool, leather, and metal are the most important.

It may seem strange that these kinds should be manufactured, since most of these raw materials are not produced in great quantities in New England. The reason is that the abundant waterfalls furnished such excellent power that it paid to bring the raw materials there to be manufactured. Later the people learned to manufacture so well, that factories were built even where there was no water power, as in Boston, where steam power is used. Since coal is now cheap, the location of a mill near an important railway, or near some other good shipping point, is a more important matter than its location near water power.

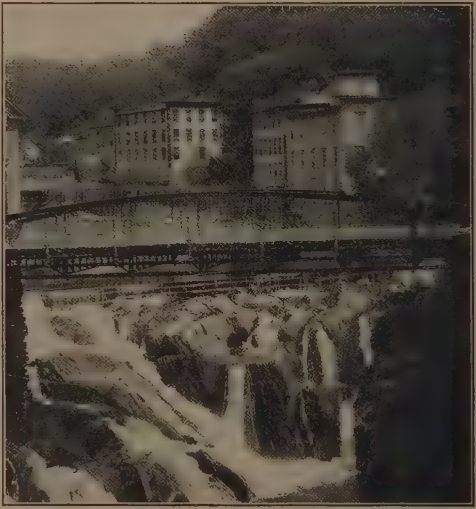


Fig. 57. — Factories in a New England village, which have been built because of the water power there.

2. Manufactures from the forest

(1) ***Lumber, and articles made from it***

The mouths of the rivers, being good shipping points, are natural sites for manufacturing towns and cities. Many such towns in Maine are engaged in lumber manufacturing. The logs from the forest are floated to them, and there much work, requiring many men, is necessary to change these to lumber, and then to various useful articles.

For example, the city of Bangor has grown up where the ocean tide checks the river current, so that the logs can be floated no farther; and vessels from the ocean can reach this point in order to carry off the lumber. The log drives of the Kennebec and Androscoggin rivers are stopped at the sawmills in several cities along their banks, such as Waterville, and Augusta, the capital of Maine; but some are carried down as far as BATH, which is noted for its ship building. On the wharves of PORTLAND are quantities of boards ready to be shipped away to be made into boxes, barrels, doors, and hundreds of other articles.

(2) *Paper*

Another important use of the forests is in making paper, for much of the paper commonly seen, such as newspaper and wrapping paper, is now made of wood. Short logs (two-foot lengths), after having the bark removed, are placed in a steel frame and forced against an enormous grindstone. The *wood pulp* thus ground off is carried away by water, run through a sieve, deposited on a wide belt, and pressed into thin sheets between rollers. When dry, it is paper. Wood pulp is also made by help of chemicals. We do not often think, when reading the news or wrapping a package, that the paper in our hands may once have been part of a live tree, perhaps in the woods of Maine.

FIG. 58. — Men and women leaving the factory at the close of the day. Notice how many people there are employed in this one factory.

Paper mills are found at RUMFORD FALLS, EAST LIVERMORE, EAST MILLINOCKET, and BANGOR in Maine. However, HOLYOKE, the greatest paper-making city in New England, is situated not in the forest region, but in the midst of busy cities in Massachusetts. There the pulp is generally made of rags, which produce a finer grade of paper. The neighboring cities furnish a large supply of the necessary rags.

(3) *Tannic acid; maple sugar and sirup*

The forest trees supply other valuable products besides lumber and wood pulp. One of these is *tannic acid*, used in tanning leather; it is made from the bark of the hemlock and other trees. Another product is maple sirup and sugar. Among the trees in the forests of New England is the *sugar maple*, which is very common in Vermont, as well as in New York, Pennsylvania, Ohio, and other states. Its sap, unlike that of most trees, is sweet; and if a hole is bored through the bark in early spring, when the sap is moving through the tree most rapidly, it will ooze forth as a watery liquid. This is then boiled to drive off some of the water, thus making maple sirup and maple sugar.

3. Textile manufacturing

(1) *Extent and variety of cotton manufacturing*

There are about 400 cotton mills in New England, making such articles as sheets, towels, stockings, underwear, thread, string, handkerchiefs, and gingham and calico dress goods. As many as 1200 persons may be employed in a single mill, perhaps three quarters of the number being women. One of these mills may consume from 60,000 to 70,000 pounds of cotton per day.

(2) *Method of cotton manufacture*

The cotton arrives in bales, each weighing about 500 pounds, and is made into cloth in the following manner: First, the dirt, small sticks, etc., are removed. Then the cotton fibers, of various lengths, are combed out straight and well mixed with one another. After that they are pressed into thin, gauzelike sheets. These are gradually drawn out and twisted into threads, and then wound upon spindles and taken to the *looms* for weaving. All this work is done by machinery.

Cotton cloths are nothing more than such threads woven together, those that extend lengthwise of the piece being called the *warp*, and those across it, the *woof*. An ordinary piece of calico has a warp of perhaps 1200 threads, while a wide piece of cloth, such as a sheet for a bed, may contain as many as 2500. Stripes and other patterns are made by coloring the threads differently, and then, before the weaving begins, carefully arranging them according to some design.

(3) *Method of wool manufacture*

After being sheared from the sheep, the wool is washed and freed from burs, sticks, etc. It is then untangled and combed out straight, after which it is twisted into yarn, much as cotton is twisted into thread. The yarn is woven into cloth for men's suits and overcoats, and also for coats, skirts, underwear, blankets, stockings, carpets, and dozens of other articles. Most, if not all, of the garments that you are wearing are made either of wool or cotton, or of the two mixed together.

(4) *Where the cotton and wool are obtained*

Most of the cotton is brought from Texas and other Southern States, but some of it comes from Egypt and other foreign countries. None is raised in New England.

The wool is cut, or *sheared*, from sheep, and much of that which is manufactured into cloth in New England is obtained from Ohio and other states farther west. Large quantities are also imported from Australia, and a small amount comes from the New England pastures.

(5) *Chief cities engaged in textile manufacture*

The following cities are engaged extensively in the manufacture of either cotton or woolen cloth, or both: in Maine, Biddeford, Lewiston, Auburn, and Augusta; in New Hampshire, Manchester, Nashua, and Dover; in Massachusetts, Lowell and Lawrence on the Merrimac River; Pittsfield in western Massachusetts, and Fall River, New Bedford, and Taunton in the southern part; in Rhode Island, Pawtucket, Woonsocket, and Providence (Fig. 61), which is the second city in size in New England. One of the largest cotton factories in the world is at Manchester, N.H. Locate each of these cities on the map.

4. Leather manufacturing

(1) *Cities engaged in it, and articles made*

Boot and shoe making is carried on in a number of cities, though the most important are Lynn, Haverhill, and Brockton in Massachusetts. Locate them. Besides boots and shoes, leather is made into many other articles, such as bookbindings, harnesses, pocketbooks, and bicycle saddles. Can you name others?

(2) *How leather is prepared*

Leather is made from the hides of animals, such as cattle, sheep, goats, horses, and hogs. After the hair is removed, the hides are taken to *tanneries*, where they are soaked in tannic acid to make them durable.

Some of the tanneries are situated near forests, as in Michigan, where there are many hemlock trees whose bark produces the tannic acid. Others are in the mountains of North Carolina, where a kind of oak grows from which tannic acid is made. Some of the tanneries of New England also are near the forest, but many, like those in and about Salem, are far away from the forests. To these, both the

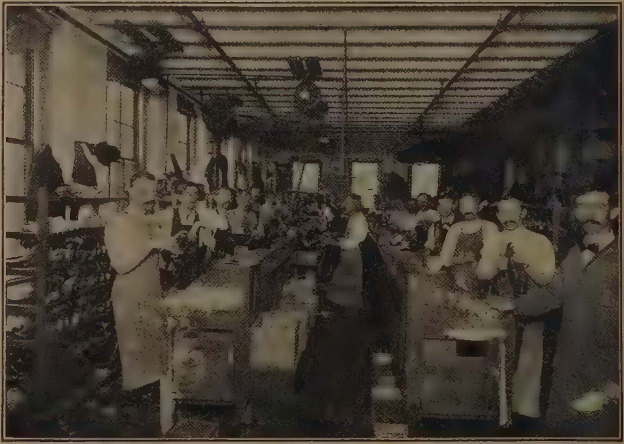


Fig. 59. — Workmen in a shoe factory in Lynn.

hides and the bark must be brought a long distance. In some tanneries chemicals are used in place of the tannic acid from hemlock or oak bark. In a single tannery near Boston, where sheepskins are tanned, from 30,000 to 40,000 skins are prepared each week.

(3) *How boots and shoes are made*

After being tanned, the leather is brought to the shoe factories and cut up, one machine cutting out soles of a certain size, a second tops, a third tongues, etc.; these parts are then sewed or nailed together, and the shoes are soon finished. As in the case of cotton and woolen manufacturing, nearly all the work is done by machinery, each person caring for one or more machines, and performing the same simple task day after day.

5. Metal manufacturing

On account of the water power, the New England people early began to manufacture metals into various articles. Although steam now largely takes the place of water power, these industries are still very extensive, especially in Massachusetts, Rhode Island, and Connecticut.

(1) *Kind of articles made, with reason*

Since very little coal and iron are produced in New England, these two materials must be shipped from other states. Therefore large, heavy objects, that require much metal and coal, are not generally made. The lighter articles, like jewelry, clocks, needles, cutlery, tools, and firearms, that require a high degree of skill, are the chief articles manufactured from metal in New England.

(2) *Cities engaged in this industry*

WORCESTER (Fig. 61), west of Boston, is noted for the manufacture of wire and iron goods, besides envelopes, boots, and shoes. Great quantities of jewelry are made at PROVIDENCE. NEW HAVEN is noted for hardware and firearms. Corsets, cartridges, and sewing machines are manufactured at BRIDGEPORT. Firearms, cars, and bicycles are made at SPRINGFIELD and at HARTFORD, which is situated at the head of steamboat navigation on the Connecticut River. FITCHBURG is also engaged in metal manufacturing.

Near Boston, at WALTHAM, the American Watch Company has an immense factory (Fig. 60), where 3100 watches are made every day. About 4300 persons, more than half of whom are women, are employed there, receiving about $200,000 a month in wages. Great numbers of clocks and watches are made in WATERBURY, and jewelry and cutlery at MERIDEN, Conn. In hundreds of smaller cities, towns, and villages in New England there are factories and mills of various sorts. Some of the cities where cotton and woolen goods are manufactured, such as FALL RIVER, LOWELL, and NEW BEDFORD, are also noted for the manufacture of iron and other metals.

All this manufacturing calls for an im-

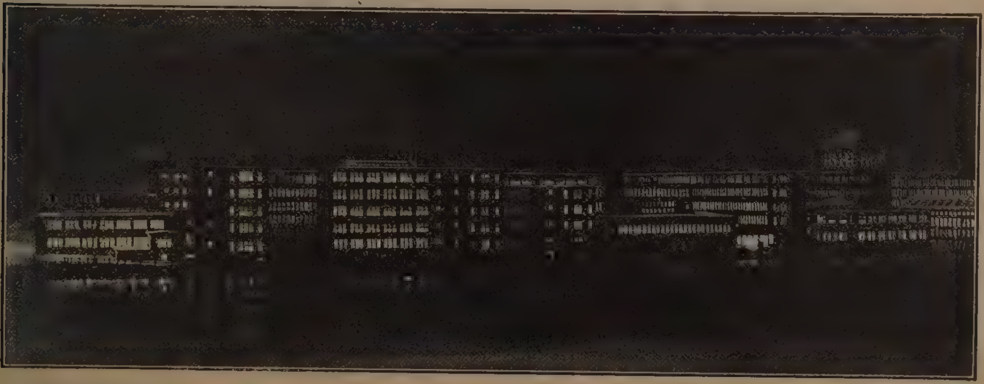


FIG. 60.—The Waltham Watch Factory at night. This is but one of the many large factories of New England.

Commerce

mense amount of lumber, cotton, wool, leather, metals, coal, and food; and most of these products must be brought from outside of New England. The commerce of New England is, therefore, extensive.

The rivers are not of great value for shipping these goods, because of their many rapids and falls. Most of them are also too short and shallow for boats. Thus, while of great service in manufacturing, the rivers have helped very little in transportation.

On the other hand, there are many good harbors along the coast. And although boats cannot ascend the rivers, railroads lead from the seaports to all parts of the interior. The railroads, together with the numerous steamship lines that ply between New England and other parts of the world (Fig. 61), furnish excellent means for transportation of goods.

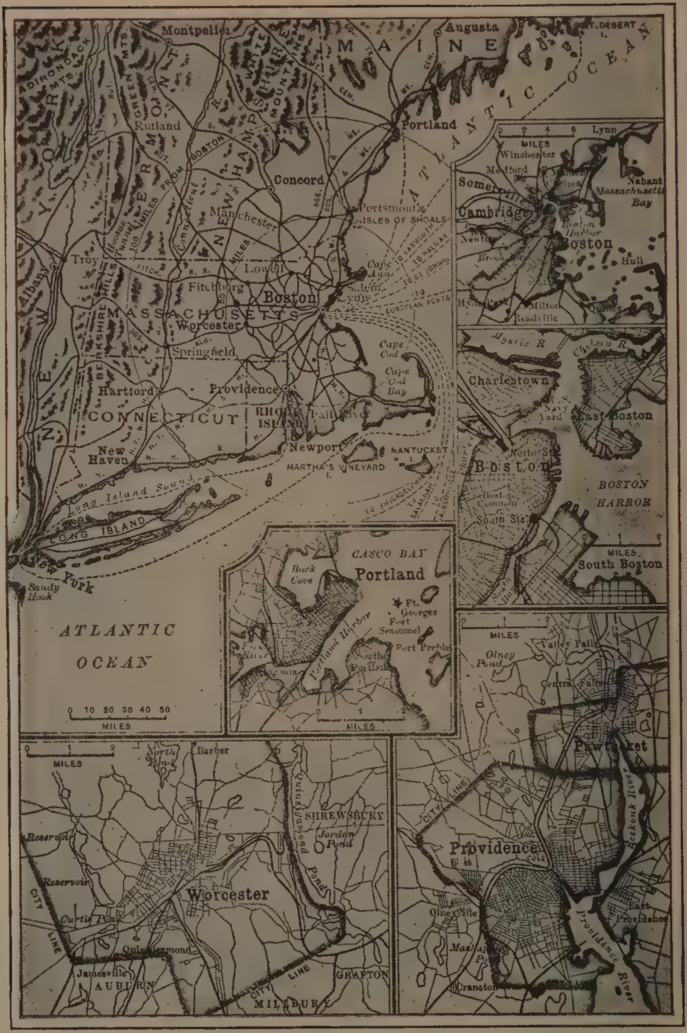


Fig. 61.—Boston and vicinity. Also small maps of Providence, Portland, and Worcester. Notice the steamship and railway lines converging at Boston. Also the number of cities near Boston.

Principal cities

1. Boston

The most important of the New England cities is Boston, the fifth city in size in the United States. It is a great manufacturing center, being engaged in most of the industries already named, and especially in making clothing. Its great size is largely due to its excellent harbor (Fig. 61), and its central location.

The port of Boston is third in importance in the United States. Great quantities of raw materials are received here, to be sent to the factories of New England; and the finished goods are shipped all over the world. Much grain and meat reach Boston from the West to be distributed among the smaller cities, or shipped abroad. In return, ships from foreign countries bring such articles as coffee, tea, chocolate, rubber, wool, hides, and bananas, which are needed in New England.

Boston and its vicinity have been important from the earliest days of our history. There, at the beginning of the Revolutionary War, occurred the Boston Tea Party, Paul Revere's Ride, and the Battle of Bunker Hill. The vicinity of Boston is also noted for its eminent men. Harvard College, the oldest in the United States, was founded in 1636 at CAMBRIDGE, three miles from Boston. Yale College, at NEW HAVEN, was started sixty-five years later, in 1701. Longfellow, Lowell, Holmes, and Agassiz were professors at Harvard; and Hawthorne, Emerson, Thoreau, and Whittier lived not far from Boston.

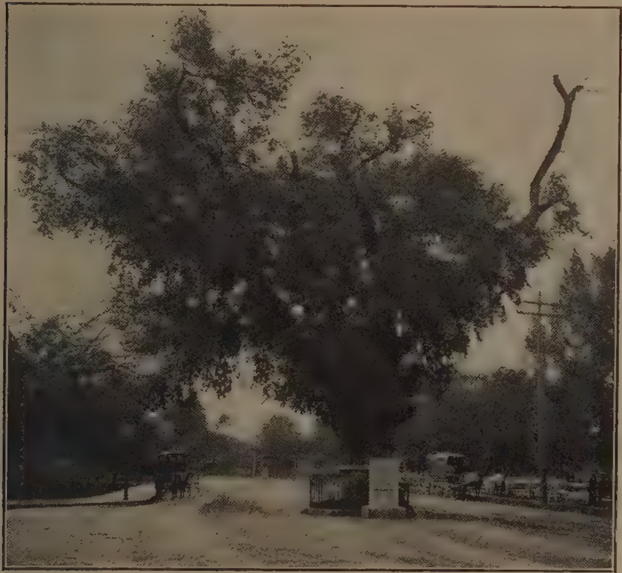


Fig. 62.—The Washington elm at Cambridge. It was under this tree that Washington first took command of the American army in July, 1775.

2. Cities near Boston

In the vicinity of Boston are many manufacturing cities and towns which also serve as places of residence for the business men of Boston. Among these the largest are CAMBRIDGE and SOMERVILLE (Fig. 61), which have important industries of meat packing, machine manufacturing, and printing. Others are CHELSEA and MALDEN, each engaged in manufacturing rubber goods and other articles.

Not far distant is SALEM, which in colonial days was even more important than Boston. Since its harbor is too shallow for the deep ships of the present time, this city has lost much of its commerce, which is now carried on in Boston. Notice, in Figure 43, that Salem was one of our large cities in the year 1790.

3. Other large cities

PORTLAND (Fig. 61), the largest city in Maine, has an excellent harbor, and is the eastern terminus of the Grand Trunk Railway, which runs through Canada. In winter, when the St. Lawrence River is frozen over, it is a shipping point for Canadian goods. NEW HAVEN, the largest city in Connecticut, and PROVIDENCE (Fig. 61), the largest in Rhode Island, are both on the seacoast.

The seacoast of New Hampshire is very small, and the largest city, MANCHESTER, lies inland near some falls in the Merrimac River; but on the coast is the important city of PORTSMOUTH. Vermont has *no* seacoast. Its largest city, BURLINGTON, is a lake port on Lake Champlain.

Summer resorts

1. Why a need of vacations

There is so much manufacturing and commerce in New England, that great numbers of people dwell in the cities; and during most of the year, they are closely confined in noisy factories, or in offices and stores. To these, the wooded mountains, the silvery lakes (Fig. 21), the winding rivers, with their falls and rapids, the green valleys, and the rocky seacoast, offer great attractions; and every summer tens of thousands leave town for a week or more, to enjoy their vacations at these places.

2. Where the people spend their vacations

Many go to the green slopes of the Berkshire Hills and Green Mountains, or climb about among the rugged peaks of the White Mountains (Fig. 63), to enjoy the wonderful scenery. Others plunge into the woods of Maine or northern New Hampshire, to hunt and fish, or to canoe upon the streams and lakes; and still others settle down at farmhouses, to enjoy the quiet of the country (Fig. 56).

Many others go to the seashore, to escape the heat and to bathe in the salt water, or to sail and row. So many go there that a large part of the New England coast is dotted with summer cottages and hotels. Indeed, people come here from all parts of the United States. Thousands visit BAR HARBOR, on Mount Desert Island in Maine, which is therefore a very busy place in summer. Along the coast, for many miles north and south of Boston, there are other noted summer resorts. Nantucket Island and Martha's Vineyard are similar resorts farther south; while just west of them, on Narragansett Bay, is NEWPORT, noted for its many magnificent summer homes.

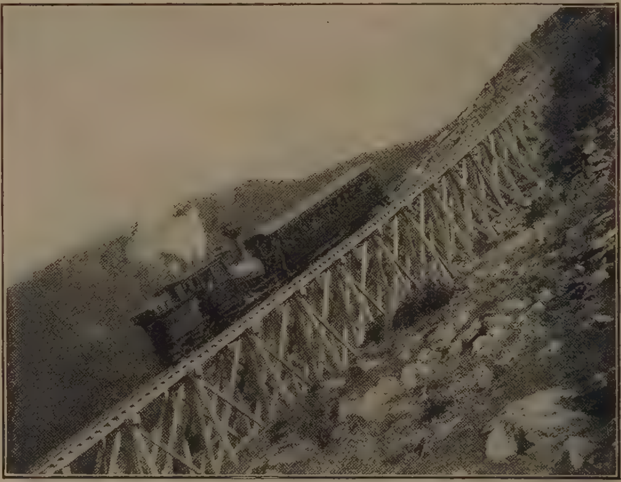


FIG. 63.—The railway up the slopes of Mount Washington, on which thousands of summer visitors are taken to the top of the mountain every summer.

Review Questions

1. State to what extent the mountains make the surface of New England irregular. Name and locate the principal mountains. 2. Explain how the Great Glacier made important changes in New England. 3. How has the sinking of the coast made the coast line very irregular? 4. Describe the climate. 5. What about the extent of the forests in New England? 6. Tell about the cutting of timber. 7. Describe the floating of the logs to the mills. 8. What hardships are there in the lumberman's life? 9. What can you tell about the granite? 10. The marble? 11. The slate? 12. What about the former abundance of fish? Name and locate the centers for the present fishing industry. 13. What kinds of fish are now caught? 14. Describe the method of catching and marketing mackerel. 15. Where are halibut and codfish caught? 16. Describe the method of catching them. 17. What are the dangers connected with such fishing? 18. What is the method of marketing these fish? 19. What other ocean foods are found in this region? 20. To what extent is agriculture important here? 21. What are the principal farm products? 22. Why is there a good market for such products? 23. Why is manufacturing very extensive in New England? 24. Where is the manufacture of lumber carried on? 25. Tell how paper is made. 26. What other forest products are obtained? 27. What kinds of textile manufacturing are there in New England? 28. What is the extent of the cotton manufacturing? 29. Describe the method of manufacturing cotton and woolen goods. 30. Where are the cotton and wool obtained? 31. Name and locate the principal cities engaged in textile manufacturing. 32. What can you tell about leather manufacturing? 33. What are the principal kinds of metal manufacturing? Why? 34. What cities are extensively engaged in this industry? 35. What advantages has New England for commerce? 36. For what is Boston important? 37. Name other cities near Boston and tell about each. 38. Locate the other large cities. For what

is each important? 39. Why is there a special need of vacations in New England? 40. Where and how do the people spend them?

Review Questions by States

Maine (Me.). 1. Draw the coast line of Maine. 2. Why is it so irregular? 3. Find the principal rivers. 4. What cities are situated on each? 5. Should you expect much fishing along the coast? Why? 6. What reasons can you give why so many people resort to the Maine coast and woods in summer? 7. Describe lumbering in Maine. 8. What cities are engaged in producing lumber? Why those? 9. What stones are quarried in the state? 10. Which is the largest city? How does it compare in size with Boston and Providence? (See Appendix, pp. 427 and 428.) 11. What other cities in Maine are mentioned in the text? Find them on the map. 12. Draw an outline map of Maine, locating the principal rivers and lakes, the capital, and other leading cities. Do the same for each of the other states as you study about it.

New Hampshire (N.H.). 13. What large lakes are found in this state? What river? 14. Name the cities on it. 15. For what are they important? 16. Why are there not more cities in northern New Hampshire? 17. What industry should you expect there? 18. Find Mount Washington; it is the highest peak in New England. 19. Where should you expect to find most farming? 20. How does the largest city in the state compare in size with Portland?

Vermont (Vt.). 21. What large lake forms a part of the western boundary? Into what waters does it empty? 22. What river flows along the eastern boundary? Through what states does it flow? 23. What is the name of the mountains? 24. Lumbering is carried on, as in Maine; into what waters must the lumber be floated? 25. What other Vermont industries are mentioned in the text? 26. There is also farming in the fertile valleys, and manufacturing, as at Brattleboro. Find Brattleboro. 27. Compare the size of the largest city with that of Manchester, N.H.

Massachusetts (Mass.). 28. Compare Massachusetts with Vermont and Maine in area; in population. (See Appendix, p. 425.) 29. Name the large cities near Boston (Fig. 61). 30. Find the principal cities mentioned in the text, and tell where each is located. 31. For what is each important? 32. What advantages do you see in the location of each? 33. Find Plymouth, where the Pilgrims landed. 34. Where is the mountainous portion of the state? Name the mountains. 35. What effect should you expect the mountains to have upon agriculture? 36. State as clearly as you can the reasons why Boston has grown to be a large city. 37. Of what importance is Boston to the cities near by? 38. Of what importance are they to Boston?

Rhode Island (R.I.). 39. Compare this state with Massachusetts and Maine in area. It is the smallest state in the Union. 40. What is the name of the bay in this state? What cities are located on it? 41. What large city is in Rhode Island? How is it important? 42. Compare its size with that of Boston and Portland. 43. Should you expect much lumbering in Rhode Island? Why? 44. What kind of farming? Why?

Connecticut (Conn. or Ct.). 45. Where are the mountains in this state? 46. Locate each of the cities mentioned in the text. 47. Tell how each is important. 48. The farms of Connecticut are better than those of Maine. Why? 49. There is little lumbering in the state. Why? 50. Compare the size of New Haven with that of Boston and Portland.

General Review Questions

51. Name the principal industries of New England. In which states are they carried on? 52. Which industry do you consider most important? Make a list of the ten largest cities (see Appendix) in New England, the states they are in, and the chief kinds of manufacturing they are engaged in. 53. Make a drawing of the New England States, including the chief rivers, cities, mountains, and the state boundaries.

Suggestions

1. Read Whittier's "Snow-Bound." 2. Read about lumbering in Chase and Clow's "Stories of Industry," Vol. I. 3. Visit a stone-yard, or a place where monuments are made, and collect some specimens from the chips in the yard. Put these in the school collection. 4. Find blocks of granite and of marble in buildings. 5. Make drawings of mackerel, cod, and halibut. You will find pictures of them in the dictionary. 6. Make a collection of cotton, wool, leather, and metals for the school; also make a collection of articles manufactured from each. 7. Find the present price of cotton per pound. At that price how much would the seventy thousand pounds, that one mill uses in a day, be worth? 8. What is the average wage, per hour, of the employees in the Waltham Watch Factory? If the working day is eight hours long, how many watches are made per minute? Per year?

3. Middle Atlantic States

Map Study

1. Which states have mountains? 2. Which has none? 3. What influence do you think the mountains have upon the industries? 4. What waters help to form the boundary of this group of states? 5. Where do natural boundaries separate the states? 6. Compare this group of states with New England in length and width (Fig. 45). Notice the scales of the two maps. 7. Which is the largest state? Is it larger or smaller than Maine? (See Appendix, p. 425.) 8. Name the three bays. Why has a city a better location at the head of one of these bays than at

the entrance? 9. Name and locate the capital of each state. 10. Find the capital of the United States. Would a location nearer the center of the country be better? 11. Name the five largest rivers. Into what waters do they flow? Through what states?

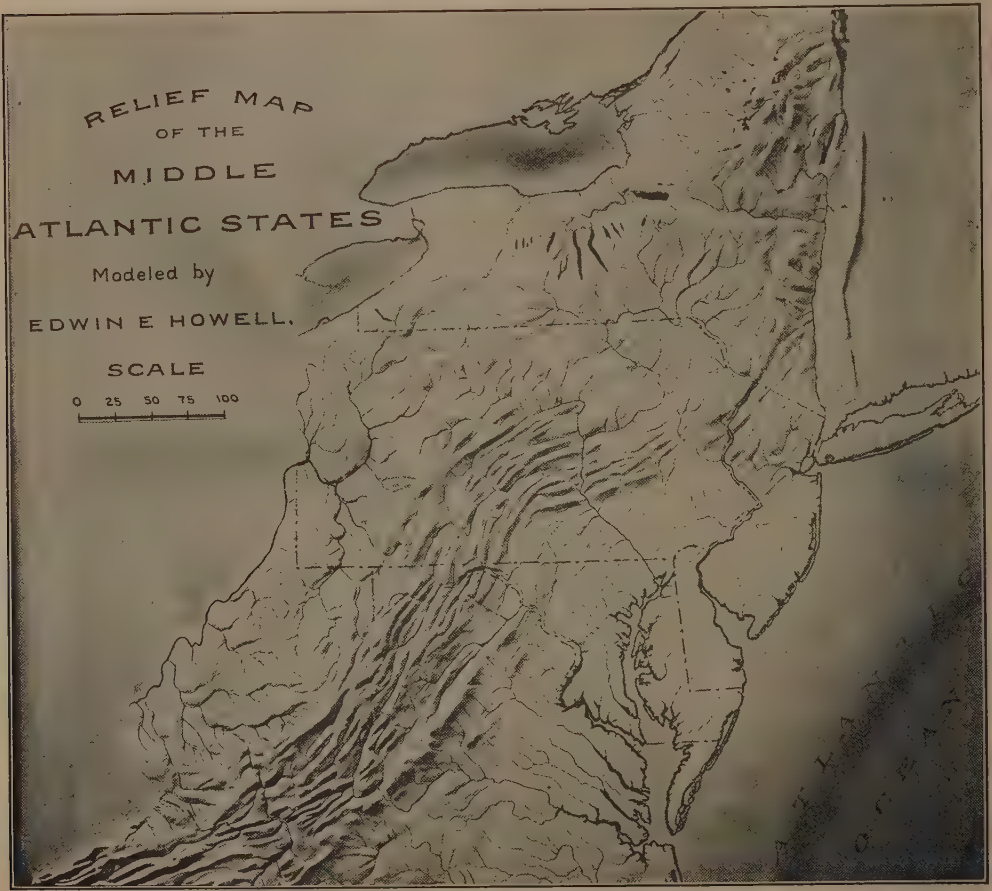


FIG. 65.—Relief map of Middle Atlantic States.

Surface features

1. Extent of the mountains

The Appalachian Mountains extend from northeast to southwest across these states. Note the number of parallel ranges. How great is the distance across this mountain system? What two mountainous sections do you find in eastern New York? While the surface of a large portion of these states is more regular than that of New England, the map shows clearly that much of the region is mountainous.

2. The Piedmont Plateau

Just east of the mountains is a low, hilly plateau of hard rock, called the *Piedmont Plateau* (Fig. 42). This is really a worn-down mountain region like New England; in fact, it represents the very roots of those mountains which rose above the sea long before the Coal Period (p. 2). The plateau slopes seaward, causing the streams to flow in short courses in the same direction.

Nearer the seacoast the country is a low

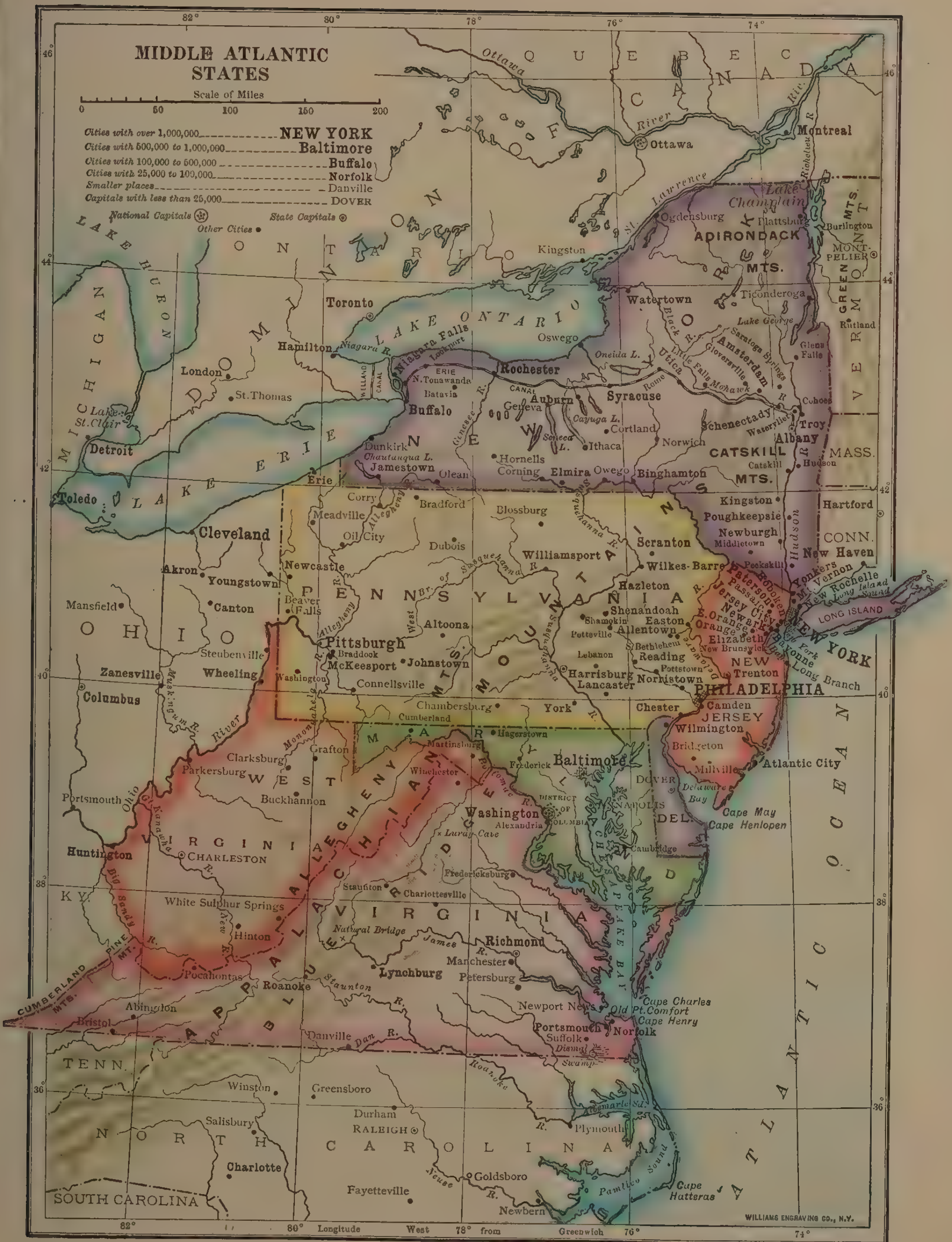

MIDDLE ATLANTIC STATES
Scale of Miles
0
50
100
150
200
Cities with over 1,000,000 NEW YORK
Cities with 500,000 to 1,000,000 Baltimore
Cities with 100,000 to 500,000 Buffalo
Cities with 25,000 to 100,000 Norfolk
Smaller places Danville
Capitals with less than 25,000 DOVER
National Capitals
State Capitals
Other Cities
82°
80°
78°
76°
74°
46
44
42
40
38
36
QUEBEC
CANADA
DOMINION OF CANADA
ONTARIO
Ottawa R.
Ottawa
Montreal
St. Lawrence River
Richelieu R.
Lake Champlain
Ogdensburg
Plattsburg
Burlington
MONTPELIER
GREEN MTS.
VERMONT
Rutland
ADIRONDACK MTS.
Kingston
LAKE HURON
MICHIGAN
Toronto
LAKE ONTARIO
Hamilton
Niagara R.
Niagara Falls
Lockport
WELLAND CANAL
London
St. Thomas
Lake St. Clair
Detroit
LAKE ERIE
Toledo
Watertown
Black R.
Oswego
Oneida L.
Ticonderoga
Lake George
Saratoga Springs
Gloversville
Amsterdam
Glens Falls
Little Falls
Mohawk R.
Utica
Rome
Rochester
ERIE CANAL
N. Tonawanda
Batavia
Buffalo
Genesee R.
Geneva
Auburn
Syracuse
Cayuga L.
Seneca L.
Cortland
Ithaca
Schenectady
Waterville
Cohoes
Troy
Albany
MASS.
Norwich
CATSKILL MTS.
Catskill
Hudson
NEW YORK
Dunkirk
Chautauqua L.
Jamestown
Olean
Hornells
Corning
Elmira
Owego
Binghamton
Erie
Corry
Bradford
Allegheny R.
Meadville
Oil City
Blossburg
Susquehanna R.
Kingston
Poughkeepsie
Newburgh
Middletown
Hartford
CONN.
New Haven
Hudson R.
Peekskill
Yonkers
Mt. Vernon
New Rochelle
Long Island Sound
LONG ISLAND
Cleveland
DuBois
Scranton
Wilkes-Barre
Williamsport
W. Br. of Susquehanna R.
Akron
Youngstown
Newcastle
Mansfield
Canton
Beaver Falls
PENNSYLVANIA
Hazleton
Paterson
Passaic
Hoboken
Jersey City
Newark
E. Orange
Orange
Elizabeth
Bayonne
New York Bay
OHIO
Altoona
Shenandoah
Shamokin
Pottsville
Easton
Allentown
Bethlehem
New Brunswick
Reading
Pottstown
Lebanon
Harrisburg
Lancaster
Norristown
Trenton
NEW JERSEY
Long Branch
Delaware R.
Pittsburgh
Braddock
McKeesport
Johnstown
Steubenville
Wheeling
Washington
Connellsville
Zanesville
Columbus
Muskingum R.
Ohio River
Monongahela R.
Chambersburg
Cumberland
York
Chester
PHILADELPHIA
Camden
Wilmington
Hagerstown
MARYLAND
Grafton
Clarksburg
Parkersburg
Martinsburg
Frederick
Baltimore
Winchester
Potomac R.
Bridgeton
Millville
Atlantic City
DOVER
ANNAPOLIS
Delaware Bay
DEL.
Cape May
Cape Henlopen
WEST VIRGINIA
Buckhannon
Portsmouth
Ohio R.
Gt. Kanawha R.
Huntington
CHARLESTON
Washington
DISTRICT OF COLUMBIA
Alexandria
Luray Cave
BLUE RIDGE
Fredericksburg
Cambridge
ALLEGHENY MTS.
APPALACHIAN MTS.
Staunton
Charlottesville
KY.
White Sulphur Springs
Big Sandy R.
New R.
Hinton
Natural Bridge
VIRGINIA
James R.
Richmond
Manchester
Petersburg
CHESAPEAKE BAY
PINE MT.
CUMBERLAND MTS.
Pocahontas
Roanoke
Staunton R.
Lynchburg
Abingdon
Bristol
Newport News
Old Pt. Comfort
Cape Charles
Cape Henry
Portsmouth
Norfolk
Suffolk
Dismal Swamp
Danville
Dan R.
Roanoke R.
TENN.
Winston
Greensboro
Durham
RALEIGH
Salisbury
Albemarle Sd.
Plymouth
NORTH CAROLINA
Charlotte
Neuse R.
Goldsboro
Fayetteville
Newbern
Pamlico Sound
Cape Hatteras
SOUTH CAROLINA
ATLANTIC OCEAN
Longitude West from Greenwich
WILLIAMS ENGRAVING CO., N.Y.

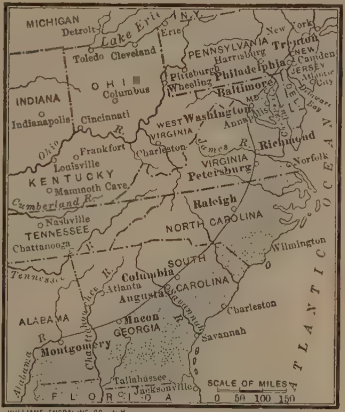
FIG. 64.

3. The Coastal Plains

plain of softer rocks, chiefly sands and clays. They were deposited on the sea bottom and then raised to form dry land. These plains, added to the country more recently, are known as the *Coastal Plains* (Fig. 41).

4. The Fall Line and its importance

From New York to Alabama the streams that flow from the Piedmont Plateau to the Coastal Plains have rapids and falls where they cross the dividing line between these two. This boundary is, therefore, called the *Fall Line* (Fig. 66). There are rapids and falls along this line, because the streams have been able to dig more rapidly into the soft layers of the Coastal Plains than into the harder rocks of the Piedmont Plateau.



WILLIAMS ENGRAVING CO., N.Y.

Fig. 66. — The Fall Line. Coastal Plains dotted, Piedmont and other sections left white. Cities printed in heavy type are located along the Fall Line.

Before white men came, the Indians placed their villages on the streams along this line. The early settlers also located their villages here, partly because of the water power, and partly because boats going upstream were stopped by the rapids and falls. Now many of these villages have become large cities. Note (Fig. 66) how many cities are on the Fall Line. Name them.

5. The slope west of the mountains

On the western side of the mountains is the Allegheny Plateau, which slopes gently toward the Ohio and Mississippi rivers. Near the mountains, in West Virginia and Pennsylvania, the rivers have cut deep valleys in this plateau; and it is therefore so rugged and rocky that it has attracted few settlers, except near the rich coal beds that lie buried in the rocks.

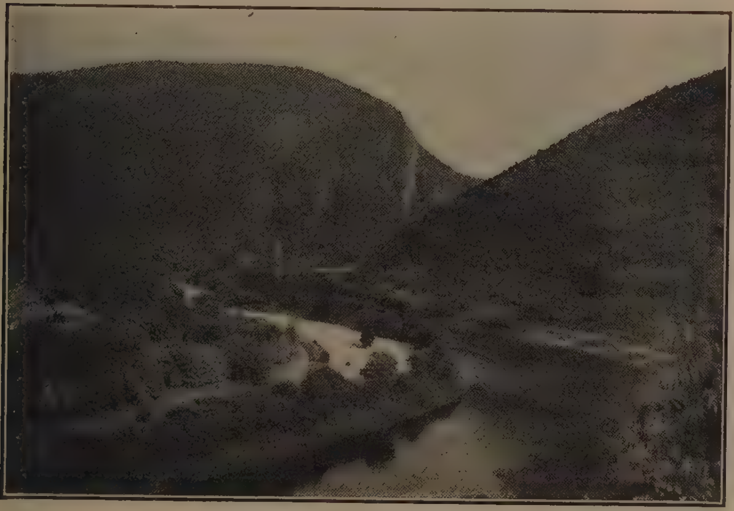


Fig. 67. — Delaware Water Gap.

6. Passageways across the Appalachians

You have already learned (p. 26) that the Appalachian Mountains were at first a serious barrier to westward migration; but at the beginning of the last century many emigrants pushed their way across them. This migration was greatly aided by the fact that several rivers, such as the Mohawk, Delaware (Fig. 67), Susquehanna, Potomac, and James flow across a part or the whole of the mountain system. These rivers formed gateways to the fertile western plains beyond the mountains. Describe the course of each of these rivers, telling through what states it flows.

7. Effects of the Great Glacier

The map shows many lakes in New York, northern New Jersey, and Pennsylvania. There are also many waterfalls and rapids. Niagara (Fig. 68), on the boundary of New York, is the grandest waterfall in the world; and two of the Great Lakes, which are also partly in New York, are among the largest lakes in the world. There are several other large lakes in this state. Name some of them (Fig. 64). As in New England, many of these lakes and waterfalls were caused by the Great Glacier. Trace its southern boundary in these states (Fig. 18). What about lakes and waterfalls south of that line?

8. Effects of the sinking of the coast

In the Middle Atlantic States, as in New England, the sinking of the land has caused numerous large bays and fine harbors. Through these the tide often reaches far inland. In the Hudson River, for instance, it extends above Albany; and in the several branches of the Chesapeake Bay, it reaches nearly to the Fall Line. Most of the coast, unlike the rocky coast of New England, is low and sandy, with long, gently sloping beaches, where the bathing is excellent (Fig. 69).

The climate

The northern part of New York is in 45 degrees north latitude. How far is that from the equator? From the north pole? How much nearer the equator is the southern part of Virginia?

While the climate of the northern part of the Middle Atlantic States resembles that of New England, that of the southern portion is much warmer. Its greater warmth is due partly to the lower latitude, and partly to the ocean currents. The cold Labrador current does not extend south of Cape Cod, but the Gulf Stream passes very near the Virginia coast (Fig. 313).

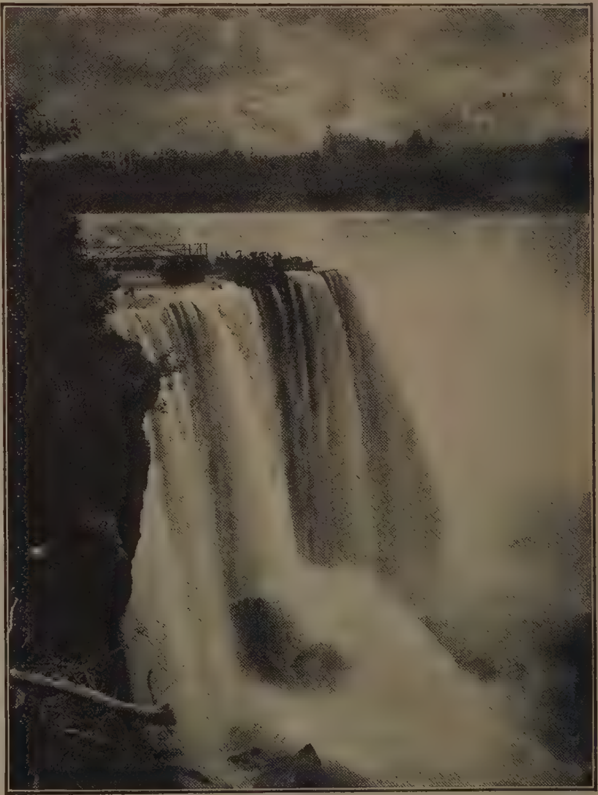


FIG. 68. — A view of Niagara Falls.

The climate in Virginia is so mild that sleighing and skating are rarely possible, while places near the entrance of Chesapeake Bay — such as OLD POINT COMFORT and NEWPORT NEWS — are important winter resorts. Among the mountains, however, the climate is cooler; and even as far south as Virginia and North Carolina there are cool summer resorts on the mountain slopes.

Photograph supplied by Pennsylvania Railroad.

Fig. 69. — Bathing on Cape May Beach, N.J.

The winds of this section often blow from the ocean, so that there is abundant rainfall for crops and for the growth of dense forests. In most of these states, from forty to fifty inches of rain falls every year.

Lumbering and related industries

Many of the prominent industries in the Middle Atlantic States are the same as those of New England. There are extensive forests in both the Adirondack and Appalachian mountains, as well as upon the Allegheny Plateau. In the southern part, in and near West Virginia, many hard-wood trees are found; but in the northern portion, both the trees and the methods of lumbering resemble those in Maine.

Williamsport, in Pennsylvania, is extensively engaged in the lumber business. There are also many paper mills supplied from the forests, as at Watertown, near the Adirondacks. The sugar maple grows in New York and Pennsylvania; and in most of the states tannic acid is obtained from the bark of the hemlock or oak.

Over most of this section the woods have been so wastefully cut down that it is now necessary for the government to protect those that are left. In several of the states there are forest reservations in which it is forbidden to cut down the trees, or where only a few of the largest are cut each year. Besides this, some large tracts of woodland, called *game preserves*, are carefully protected by certain citizens, for the purpose of fishing and hunting at the proper season. State laws also protect the game.

Fishing

Fishing for cod and halibut is a much less important industry than in New England. It is too far to the Fishing Banks (p. 37) for many vessels to go there from the Middle Atlantic States.

1. Kinds of fish caught

Some vessels are engaged in catching mackerel, bluefish, and other ocean fish; and many *shad* are caught in the bays and rivers. This fish swims into fresh water each spring in order to lay its eggs, or spawn; and the young remain there until they are large enough to venture to the sea. It is while they are on the way to or from the spawning grounds that most shad are caught.

2. The oyster industry

Oysters are found all the way from Cape Cod to the Rio Grande (Fig. 267); but one of the best places for them is Chesapeake Bay, where the waters are warm, shallow, and quiet. From this broad, branching bay they are collected in great quantities, some being shipped away fresh in the shell, while many are canned, like fruit. Baltimore and Norfolk are especially noted for this industry.

When young, the oysters swim freely about; but after reaching a certain age, they sink to the bottom, fasten themselves to some solid substance, like a stone or an oyster shell, and never afterwards move from that spot. They depend for food upon what is brought to their mouths by the tidal currents.

Oysters live only in shallow water, and can sometimes be picked up by hand from a boat; but usually they must be dragged, or *dredged*, up with a long-handled rake. Small steamers and sailing boats are used for gathering them. Many men are engaged in the oyster industry, which is so profitable that there are many private oyster beds, which are carefully protected. Such beds are sometimes called oyster farms, or plantations. Young oysters are often brought here and put into the water to grow, as seeds are planted in a garden.

Agriculture

1. Where the farms are located

There is more good farm land in the Middle Atlantic States than in New England, and agriculture is, therefore, a more important industry. The low, level Coastal Plains, the gently rolling Piedmont Plateau, and nearly all of New York, except the Catskill and Adirondack regions, are dotted with farms. There is also much farm land in the broader valleys of the Allegheny Plateau, west of the mountains, and in the valleys which lie between the Appalachian Mountain ridges. Among the latter by far the most important is the *Great Valley* of Pennsylvania, Maryland, and Virginia.

2. Dairying

Many of the farmers turn their attention chiefly to dairying; and, although butter and cheese are made in every state in the Union, this work is especially important in New York.

Fig. 70. — A dairy herd in New York feeding in the pasture late in the Fall, after the first snow has fallen.

The number of cows in a dairy herd (Fig. 70) varies from a dozen to several score. In summer they are allowed to graze in the pastures, but during the winter they are kept in large barns, where hay is fed to them. Twice each day they are milked, and, as in New England (p. 39), the milk may be sent to a neighboring city to be sold by the quart, or it may be kept for making butter or cheese.

UTICA, on the Mohawk River, is an important cheese market; and small cheese and butter factories, or *creameries*, are scattered over New York. They are common in the other states, also. These creameries furnish a ready market for the milk, and are therefore of great value to the farmers near by; indeed, milk is even brought by train to some of the creameries.

3. Tobacco

The tobacco plant, which grows to a height of about three and a half feet, has large, thick leaves (Fig. 106), somewhat like those of the pie-plant, or rhubarb. These leaves, which are the valuable part of the plant, are plucked in the fall, hung in a room to dry, and then are ready for market.

The climate of most parts of New England and New York is too severe for this plant, but large quantities are raised in the Connecticut Valley, and in the valleys of southern New York, Pennsylvania, and states farther west (Fig. 256). Far the greatest amount of tobacco raised in the Middle Atlantic States comes from Virginia. In the vicinity of LYNCHBURG and DANVILLE, where much tobacco manufacturing is carried on, immense quantities are grown; and RICHMOND and PETERSBURG, on the Fall Line (Fig. 66), are among the leading tobacco markets of the world. Find these cities on the map.

4. Raising of fruits and vegetables

(1) Sections important for these products

Both the soil and the climate of these states are well suited to the raising of fruits and vegetables. Nearly every farmer raises some of each. The sections near large bodies of water, however, have the best climate for fruit. This is because the presence of water tends to equalize the climate, thus checking the danger from frosts.

One of the most noted sections for fruit is along the southern shores of Lake Erie in western New York. Here grapes in particular are cultivated (Fig. 71). Apples form another important fruit crop in New York, being grown in many parts of the state, but especially along the southern shores of Lake Ontario. There is so much fruit raising in New York that the *nursery business*, or that of raising young fruit trees, vines, and bushes to sell, is a flourishing industry. One of the principal centers for this business is ROCHESTER.

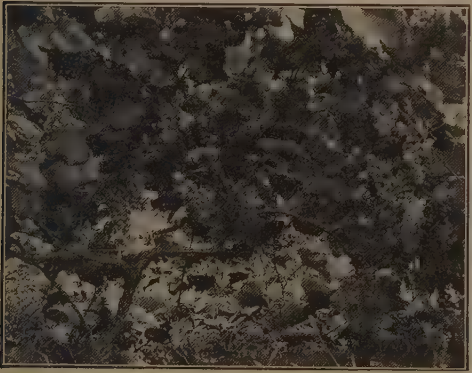


FIG. 71. — Grapes on a vine in a vineyard in western New York.

On the Coastal Plains and Piedmont Plateau of eastern New Jersey, Delaware, Maryland, and Virginia, grapes, peaches, strawberries, apples, and other fruits flourish. Besides fruit, such common vegetables as potatoes, sweet potatoes, tomatoes, beans, and sweet corn are grown in the Middle Atlantic States.

(2) *The market for them*

There are so many large cities in these states that there is great demand for fruits and vegetables. In the early spring they are sent from the south in large quantities to the northern markets, being carried on fast trains, and often in special cars. Many kinds are eaten fresh during the proper season.

The *canning* of fruits and vegetables for winter use has become an important industry in several cities, as in BALTIMORE and WILMINGTON. Many farmers are engaged almost entirely in raising crops for this purpose. Probably as many peaches, berries, tomatoes, etc., are put up in cans, as are eaten fresh. These canned goods may be seen in every grocery store. The fruits are prepared for use in other ways also; for instance, the juice of grapes is made into wine, and that of apples into cider and vinegar.

5. Other farm products

Besides the cattle necessary for dairying, many horses are raised in these states. In some of the more hilly sections, like western New York and Pennsylvania, there are many sheep. Hogs are raised on most of the farms; and also hens, ducks, and turkeys.

Among the most important crops of the Middle Atlantic States are hay and the grains, such as wheat, oats, corn, barley, rye, and buckwheat. Far more land is used for these crops than for those already mentioned. However, since the states farther west are even more noted for hay and grain, a description of this kind of farming will be given later, in connection with those states (pp. 93–97).

Mining

There are many more kinds of mineral products in the Middle Atlantic States than in New England; and they are far more valuable.

1. Salt

One of these is salt, a mineral which is necessary to every one. In the early days salt springs were discovered at the point where SYRACUSE now stands, and that city owed its early growth to those springs. Little salt is now produced there; but large quantities of soda are made of brine obtained from the salt beds near by.

These beds of salt were deposited in the sea which covered this region before the Coal Period. They were later buried beneath layers of rock, much as the coal beds were buried.

(1) *Where found*

In the region south of Syracuse and Rochester, the salt beds lie deep in the earth, and from them salt is obtained at a number of places. In fact, New York produces more salt than any other state, with the exception of Michigan, which ranks first. Ohio and Kansas also produce large quantities.

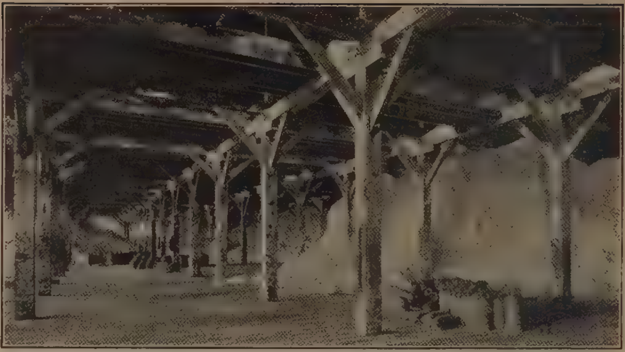


Fig. 72. — The salt in these great piles was brought to the surface in brine that rose through wells bored down to the salt beds of central New York. The brine was then evaporated, leaving the salt.

(2) *How obtained*

When in the earth, salt is hard, somewhat like coal, and may be obtained in either one of two ways. By the one method a small hole is bored to the salt, and water allowed to run down and dissolve it; then the brine is pumped up and the water is evaporated by heat until only the salt is left (Fig. 72). By the other method a deep hole, or *shaft*, large enough for men to pass up and down, is dug down to the salt; then lumps of salt are broken off and hoisted to the surface. A salt mine is a beautiful sight with its clear, crystal white walls and clean floor.

2. Coal

(1) *Where found*

Although there is little water power south of the region that the glacier covered, there is much coal — an excellent substitute. The coal swamps, that existed millions of years ago (p. 2), stretched from the ancient Appalachian Mountains westward beyond the Mississippi River. Most of the coal now found in this region is soft, or *bituminous*, coal, and enormous quantities of it are mined (Fig. 73). In two or three places, however, as near WILKES-BARRE and SCRANTON, there are beds of hard coal, or *anthracite*. It is to this coal that these cities owe their importance.

Although much coal is mined in other parts of the country, the Middle Atlantic States are most noted for this mineral. About half the coal of the United States comes from Pennsylvania; West Virginia is second, and Illinois third, while Ohio produces a large quantity.

Fig. 73. — A miner digging out bituminous coal in a tunnel, far underground, near Pittsburg. The entire wall of this tunnel is solid coal.

(2) *How anthracite coal was formed, and its special value*

Anthracite coal was once soft. Had it not been for the folding of the mountains, it would doubtless now be bituminous coal, like that farther west, near PITTSBURGH. But the pressure caused by the folding of the mountain rocks has changed it to hard coal. All woody matter, and even soft coal, contains gases; but in the anthracite these gases have been mostly driven off.

This has made anthracite coal harder and more difficult to burn; but since it gives forth a more intense heat than bituminous coal, and burns with less smoke, anthracite is preferred for some purposes, such as heating and cooking. Throughout New England and many parts of the Middle Atlantic States, it is almost the only coal used for these purposes.

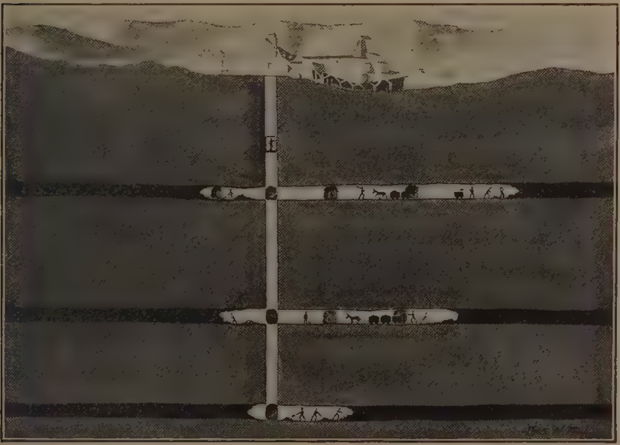


FIG. 74. — A drawing to illustrate how coal is mined. There is a shaft going straight down, then tunnels extend off from it into the different coal beds.

(3) *Method of mining*

In some places the coal is found close to the surface, though in many others it is several hundred feet beneath the surface. Where the coal lies far down in the earth, deep *shafts* must be sunk to reach it. From the sides of such a shaft, *tunnels* (Fig. 74) are dug into the coal beds, and from these the coal is removed.

Usually there are several beds of coal, with thick layers of rock between, and the shaft extends downward through them all, with tunnels reaching out into each of the coal beds (Fig. 74). In a large mine one may travel through miles and miles of tunnels. Since it is very dark so far underground, the tunnels are sometimes lighted by electricity; but the workmen often furnish their own light by means of lamps fastened to their caps.

The miners drill holes in the coal beds with drills run by steam or compressed air, and break the coal out by blasting; the larger lumps are then broken up with picks. After this is done, the coal is placed in cars, drawn to the shaft by mules, or by electricity, and then hoisted to the surface. The mules are kept underground for months, being fed and allowed to sleep in stables cut out of solid coal.

(4) *How anthracite coal is prepared for market*

Soft coal is sold in the form that it reaches the surface; but anthracite must first be sorted so that the lumps of one size are together. This work is done in great buildings, called *coal breakers*, which stand close by the mouth of the shafts. The coal is hoisted to the top of the breaker, where the larger lumps are broken up. It then passes down through the building and is separated into different sizes by means of sieves and various kinds of machinery.

There is much rock mixed with the coal, and this must be picked out. Some of this work is done by machinery; but much of it is done by boys, called *breaker boys*, who sit on low wooden benches, as the coal passes by, watching carefully for pieces of rock. These they pick out and throw away. You can imagine how black they become before their day's work is done.

(5) *Uses of coal*

Both the hard and the soft coal are used not only for heating houses and for cooking, but also in making steam for use in running locomotives, steamboats, and the machinery of factories. Much coal is used also in smelting iron and other metals, and in the manufacture of illuminating gas for use in lighting houses. Coal is, indeed, the most useful of all minerals. Without it, our country could not have prospered as it has. It is fortunate, therefore, that there is so much coal in the United States, and that it is found over so large an area.

In the rocks of the plateau along the

3. Petroleum and natural gas

(1) *Where found*

western border of the Appalachian Mountains, two other fuels, oil and natural gas, are often found. *Petroleum*, as the oil is generally called, means "rock oil,"—a name which suggests its origin.

Formerly no region in the world produced so much oil as western Pennsylvania, West Virginia, and eastern Ohio; but now this region is rivaled by California and a part of the Gulf region in Oklahoma and Texas. Outside of the United States the only region in the world that approaches either of these in the amount of oil produced is in Russia, near the Caspian Sea.

(2) *How formed*

Ages ago, when the layers of rock were being deposited on the ocean floor (p. 6), countless numbers of animals and plants, dying and dropping to the bottom, were imprisoned in the sediment and deeply buried. These then slowly decayed, forming oil and natural gas which entered the crevices between the grains of the sandstones and other rocks. Thus these substances have become stored deep down in the earth. Oil of much the same kind is now manufactured from fish; and nearly the same kind of gas may often be seen rising from swampy places, where plants are decaying.

(3) *How obtained from underground*

When a hole is bored down to a rock layer where gas is thus stored, the gas rushes to the surface. It is then led away in pipes, often to distant places. Thousands of homes in BUFFALO, PITTSBURGH, and other cities are heated with natural gas; and in many factories, too, the gas is used for fuel.

Borings in which petroleum rises are called *oil wells*. From these the oil sometimes spurts, or gushes out; but frequently it must be pumped out. Near the oil wells cities have grown up, such as BRADFORD and OIL CITY in Pennsylvania, and OLEAN in New York.

(4) *Products from the oil*

After being taken from the earth, the petroleum is stored in large tanks and then refined. In its natural state it is a thick, dark yellow or reddish yellow fluid; but in the refinery it is changed so that a large part of it becomes clear, colorless *kerosene oil.*

Benzine, naphtha, and gasoline are also made from petroleum. The thick substances that are left, after the refining, are used in making dyes of various kinds, machine oil, vaseline, and paraffin. The latter is used in many ways; for example, in making chewing gum, and candles.

(5) *Principal company handling oil*

The oil business is mainly in the hands of the Standard Oil Company. From the wells the oil is led to the refineries in pipes (Fig. 75), sometimes hundreds of miles long, and the company owns many special tank cars for hauling the kerosene, as well as steamers for shipping it to foreign lands. Watch for one of the tank cars, and describe it.

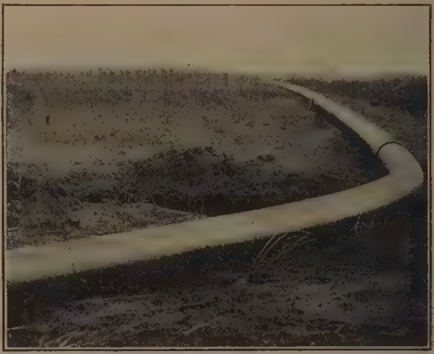


FIG. 75.—A large pipe through which petroleum is flowing from the oil wells to the refinery.

4. Iron ore

(1) *Where found, and why important*

Pennsylvania, West Virginia, and the other states mentioned enjoy a great advantage in having such an abundance of coal, oil, and gas for fuel. Iron ore is also found in New York, Pennsylvania, Virginia, West Virginia, New Jersey, and some other states. Thus both the raw material and the fuel for manufacturing it into useful articles, are found almost side by side. Both coal and iron are easily sent to all the cities of the Middle Atlantic States for use in the factories. This is very important, since iron is the most useful of all metals for manufacturing.

In appearance, iron ore is sometimes a hard, black mineral; sometimes a soft, loose, *(2) Its appearance; also how formed and mined*

yellowish or reddish brown earth. It is not *iron* at all, any more than *wheat* is flour; it is only *iron ore*, a mineral out of which iron may be made by a great deal of work.

Like coal, the iron ore in the earth was prepared long ago, though in a very different manner, as follows: Small quantities of iron exist in many minerals and rocks; indeed, the red and yellow colors of many soils, and of some rocks, are due to it. As water slowly works its way through the rocks, it dissolves the iron, much as it would dissolve salt or sugar if those substances were there. Where the conditions have been favorable, the water has brought quantities of the iron to one point, and there deposited it. This has formed beds, or *veins*, of iron ore, and it is these that are now being mined.

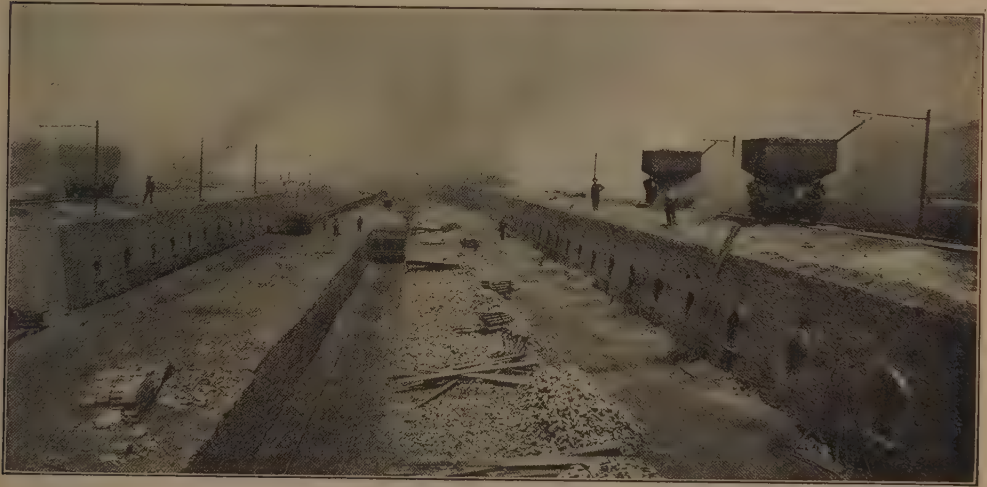


FIG. 76. — Coke ovens near Pittsburgh. Each of the small doors leads to an oven where the coal is burned and changed to coke.

Sometimes the veins lie very deep, and the ore must be mined in much the same way as coal is mined (p. 55). Again the veins are so near the surface that the ore is taken out of great open pits, somewhat as stone is removed from a quarry.

5. Other mineral products

Besides these valuable substances, there are many other minerals found in these states. Among them are zinc, found in New Jersey; gypsum and graphite, or black lead, in New York; and a great variety of clays and building stones in all the states. Pennsylvania, for example, produces more slate, sandstone, and limestone than any other state in the Union. Pennsylvania leads all other states in the value of its building stone, and New York ranks third.

Manufacturing

1. Manufacture of iron goods

(1) How iron is made

To obtain iron from iron ore, two materials, coke and limestone, are used. They are mixed with the ore and heated, and the process of getting out the iron is called *smelting*.

Coke is obtained from soft coal by burning it in stone or brick furnaces, called *coke ovens* (Fig. 76). There the coal is set on fire, and the ovens are closed, so that little air can enter. Indeed, so little air is let into the ovens that only a small part of the substances in the coal is burned. It is mainly the gases in the coal that are burned up or driven out, one of these being the common illuminating gas, already mentioned (p. 55). The solid part that is left forms very light, porous coke. This can then be burned and made to furnish intense heat, if supplied with plenty of air. It is this heat that is used to melt the iron ore.

Limestone is obtained from limestone quarries. It is valuable because it unites with the worthless part of the ore, forming a substance much lighter than iron, called *slag*. This is easily separated from the iron, and is thrown away.

In reducing iron ore to iron, more coke than ore is used, so that it is a special advantage to have the mines of coal and iron ore near each other. The coke, iron ore, and limestone are all dumped together into a high, towerlike structure, called a *blast furnace* (Fig. 77). It is so named because a blast of air is forced through it, to produce a strong draft while the coke is burning. The great heat melts the ore and limestone, and the iron, being heaviest, sinks to the bottom of the fiery hot liquid. The limestone, united with those parts of the ore that are not iron, rises to the surface, forming worthless slag, which is drawn off through an opening in the furnace. Through a lower opening, the heavy iron is run off into trenches, made of sand, on a sand floor.

There is one main trench with many side branches, and each of these has still smaller branches connected with it, as shown in Figure 78. When the molten iron cools, the little bars of iron, called *pig iron*, are still attached to a larger one. These rough bars, which are small enough to be lifted, are then broken off and shipped away, to be made into thousands of different articles.

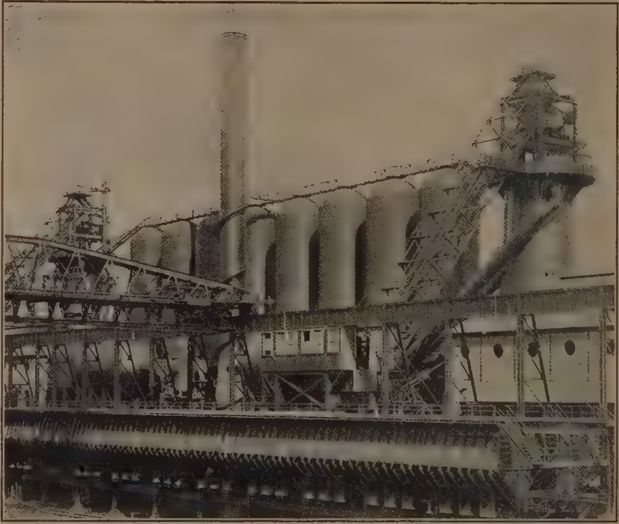


FIG. 77. — A blast furnace in which iron ore is changed to iron.

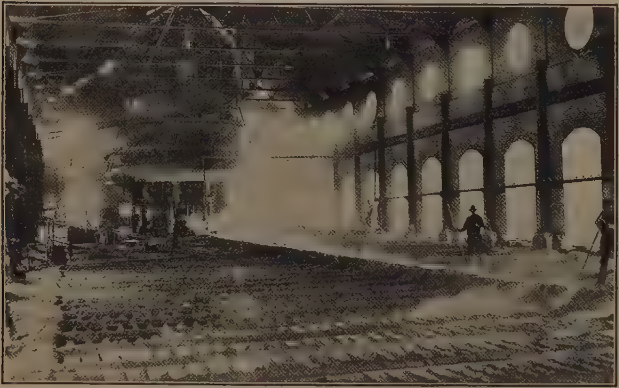


FIG. 78. — Interior of a blast furnace. Here the white-hot iron is running down a trench near where the men are standing, then into side branches, where it cools as pig iron.

(2) *The kinds of iron made*

Some iron goods, such as stoves and the iron parts of your desk, are nothing more than this pig iron melted and cast, in molds, into the shape that is desired. This is *cast iron*, which is so brittle that it easily breaks under a heavy blow. Other materials, such as knife blades, boiler plates, rails for railways, and watch springs are made of *steel*. This also is made of pig iron, though not until it has been melted again and greatly hardened and strengthened by an expensive process. *Wrought iron*, a third kind, is used where it is necessary for the metal to be tough and at the same time to bend easily, as in iron wire.

(3) *Centers for iron manufacturing*

Almost every city in the Middle Atlantic States is engaged in iron work of one kind or another, some in making iron and steel out of ore, others in manufacturing articles out of iron and steel. For example, in

New York State, Buffalo manufactures car wheels, machinery, and many other articles. It has several thousand factories, many of them making iron goods. In New York City, iron and steel products of almost all kinds are made. Iron and steel goods, bicycles, etc., are manufactured in Syracuse; stoves are made in Albany and Troy; and there are iron foundries in Binghamton, Elmira, and Schenectady.

In Pennsylvania, Philadelphia manufactures steel ships, cars, and hundreds of other iron products; Pittsburgh, to which Allegheny is now united, makes steel and iron goods of nearly every kind (Fig. 79); and Scranton, Reading, Harrisburg, Erie, Altoona, and a score of other places, have furnaces, foundries, and machine shops for iron manufacturing. In New Jersey, Jersey City, Newark, Camden, and Hoboken manufacture iron goods. In Delaware, Wilmington is noted for its cars and steel ships. In Maryland, Baltimore, like Philadelphia and New York, has a great variety of iron manufactures. Wheeling in West Virginia, and Richmond and Roanoke in Virginia, are also engaged in such work.

Fig. 79. — Homestead Steel Works, one of the many iron and steel manufactories in and near Pittsburgh.

The importance of even a single manufactory is proved by the following facts: At the Osborne works in Auburn, New York, where farming implements, such as mowers, rakes, reapers, and harrows are made, over 2700 men have been employed at one time, making one complete implement every forty seconds. In a year these men and their families consume about 9000 barrels of flour, 62,000 bushels of potatoes, 200,000 dozen eggs, 1,400,000 quarts of milk, 375,000 pounds of butter, and 1,300,000 pounds of meat, besides much coffee, tea, and sugar. Since they also need to buy clothes, shoes, etc., this one factory, by furnishing the money for all these purchases, helps to support farmers, storekeepers, shoe factories, railways, and many other industries. However, since it is the farmer who buys the implements, it is he who has really caused the factory to be built. Thus one is dependent upon the other.

2. Manufacture of glass, pottery, brick, and cement

(1) Glass

Manufactories using three other mineral products are especially worthy of note. One of these is *glass*, which is made at and near Pittsburgh, Wheeling, and other places, especially where natural gas furnishes cheap fuel. In the vicinity of the former city, there are sands which, when mixed with other substances, and melted, make an excellent quality of glass. Pittsburgh is the greatest center in the country for the production of plate glass.

(2) Pottery and bricks

In a number of places clay is found which is suited to the manufacture of *pottery*; but much clay for pottery is imported. A high grade of pottery is made at Trenton, N.J., where the pottery industry has become very important.

So many *bricks* are used for building, that brick yards are found in the neighborhood of nearly all cities. Bricks are made of clay, which is first pressed into the brick shape when damp, then dried, and finally baked. In this process some of the grains melt, so that when cooled again, they cling together like stone. The clays near Philadelphia, and the great clay beds of the Hudson Valley, above New York City, supply an abundance of brick for these and neighboring cities.

(3) Cement

Portland cement has become of great importance within the last few years. It is made in many places, especially in New Jersey, Pennsylvania, and New York. To make it, limestone is ground fine and mixed with coal dust. The two are then placed in a furnace, where the burning coal dust gives out so much heat that the limestone melts. It comes out of the furnace as a kind of clinker, which is then ground into fine powder for use. This cement has the valuable property of becoming hard like rock, or *setting*, when water is added. It is used for sidewalks, for buildings, dams, bridges, and many other purposes, taking the place of wood, stone, and iron.

3. Other kinds of manufacturing

In the Middle Atlantic States, as in New England, there are many other kinds of manufacturing. For example, flour is made at ROCHESTER; silk at PATERSON; shirts, collars, and cuffs at TROY; starch at OSWEGO; cotton goods at UTICA; boots and shoes at BINGHAMTON and ROCHESTER; carpets and hats at YONKERS; and furniture at JAMESTOWN. Cotton and woolen mills are found at a number of places, and the manufacture of clothing is of great importance in all the large cities. There is some manufacturing in nearly every town; and in the larger cities so many different kinds flourish that a score of pages would be required even to make a list of them.

Commerce

1. Its extent

Since the Middle Atlantic States, unlike New England, produce great quantities of coal and iron, as well as many other raw materials, they have more manufacturing, and a much greater population, than New England. Trade and transportation of goods are, therefore, much more extensive industries here.

2. The harbors

As in New England, the commerce is due, first of all, to the excellent harbors along the coast. Locate the three bays here: that is, New York Bay, Delaware Bay, and Chesapeake Bay. The most noted harbor of all is on the first, at the mouth of the Hudson River. The others are also very important, for large vessels can ascend Delaware Bay as far as PHILADELPHIA, and Chesapeake Bay to BALTIMORE and WASHINGTON. The mouth of Chesapeake Bay, as well as its branches, has fine harbors, such as that of NORFOLK. Note the cities in that section, and observe how easy it is to reach RICHMOND, the capital of Virginia, by water.

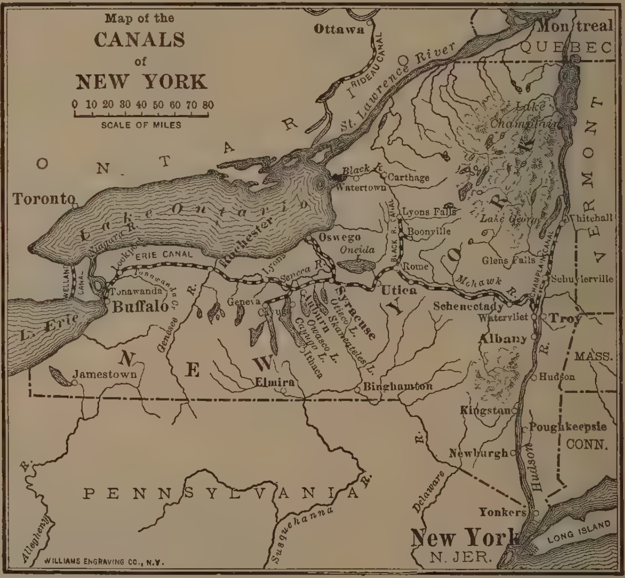


FIG. 80.—The Erie Canal and other water routes of New York and vicinity.

3. Connections with the interior

(1) By water

Good harbors are of little use unless they can be easily reached from the interior. New York Bay is especially favored in this respect, for it is connected by water with the very heart of the fertile country to the west. This water way first leads northward up the Hudson River, where the ocean tide rises as far as Troy, just above Albany. Thus, good-sized boats can go as far as that point.

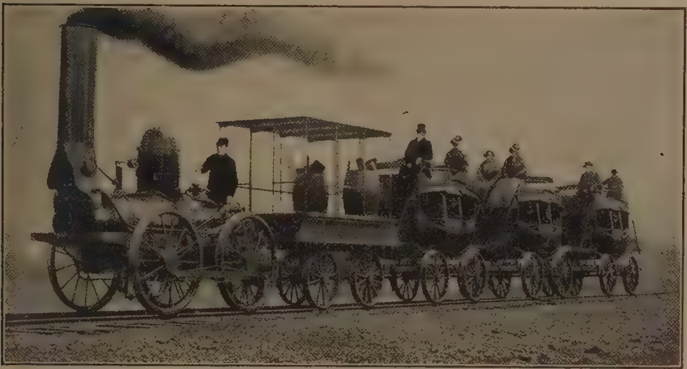


FIG. 81.—The first railway train which ran out of Albany.

From near Albany, westward, the *Erie Canal* (Fig. 80) has been dug for a distance of three hundred and fifty miles, connecting the Hudson River with Lake Erie at BUFFALO. The canal follows the route formerly taken by the Indians, which is the easiest route from the Eastern States to the central part of the country. From Buffalo, lake boats are able to go to Cleveland, Detroit, Chicago, Duluth, and other ports on the Great Lakes. Thus by river, canal, and lake, New York harbor is connected by water with a productive, thickly settled country extending westward for more than a thousand miles. This is one of the most extensive and useful interior water ways in the world.

FIG. 82.—The Empire State Express, one of the trains of the present day on the New York Central Railroad. This picture was taken while the train was running at a speed of 90 miles an hour.

Several shorter canals have been built in New York, as may be seen in Figure 80; point them out and explain their importance. The smaller lakes are also used for transportation. Locate some of them. A number of canals have been built in Pennsylvania, as well as in New York; but there is no canal connecting Philadelphia with the Great Lakes, because the Appalachian Mountains and Allegheny Plateau lie in the way.

(2) *By rail*

The Erie Canal is not nearly so important at present as it was at first, though it is now being enlarged to a barge canal. It is largely because the railways carry freight much faster, that the canal has lost much of its importance. When the Erie Canal was dug, there were no railways; but when it was found that steam could be used for running locomotives, men began to build railroads rapidly.

One of the first and most important railways in the country was built in New York State (Fig. 81). This line, now called the New York Central, extends from the very heart of New York City along the Hudson

River to ALBANY, where it connects with Boston trains. From Albany westward to BUFFALO the route is almost the same as that of the Erie Canal. At Buffalo the Central connects with railways leading to various points in the West. Several other railways connect New York with the West, some of them entering the city through tunnels under the Hudson River.

As in the case of New York, great trunk lines enter PHILADELPHIA. These connect it with the other cities of Pennsylvania, such as HARRISBURG, the capital, and PITTSBURGH, as well as with the cities of the North, South, and West. Among these lines are the Pennsylvania Railway and the Baltimore and Ohio Railroad. Baltimore, Washington, and Richmond are likewise connected with the interior by important railways, the Pennsylvania and the Baltimore and Ohio roads passing through the former two.

Principal cities

1. New York City and vicinity

(1) Population near New York harbor

The greatest of all the cities of the United States is NEW YORK, which contains nearly five million inhabitants, and is second only to London among the great cities of the world. There are several other large cities near by, the largest being JERSEY CITY, NEWARK, ELIZABETH, PATERSON, and HOBOKEN (Fig. 89), all west of the Hudson River in New Jersey. Although in another state, they are so closely related to New York in business that they may almost be considered a part of New York City; so also may YONKERS, which lies up the Hudson just above New York City. Before it became a part of New York, the city of BROOKLYN, on Long Island, was itself fourth among the cities of the country. Probably more than six million persons, or one fifteenth of all the inhabitants of the United States, live within twenty miles of New York harbor.

(2) Reasons for this vast population

It is, *first of all*, the excellent opportunity for shipping that has caused so great a number of people to collect at this point. Not only can goods be easily sent far inland by water and rail, as already explained, but they can also be carried on the ocean to any port in the world. The harbor is deep enough for the largest vessels, and large enough to accommodate all that come. Thus it is the connecting link between the distant interior and distant ocean ports. More than half of all the foreign trade of the United States is carried on through this port, which is the leading shipping point in the New World.

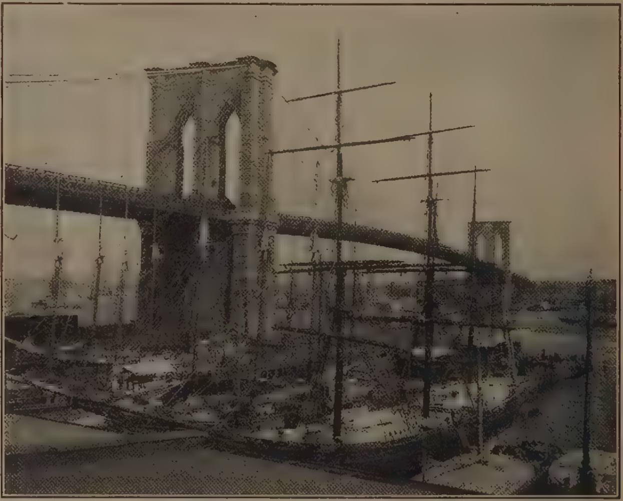


FIG. 83.—Brooklyn Bridge, connecting Brooklyn and New York.

The *second* reason for the vast population here is the fact that this is the greatest manufacturing center in the New World. The place from which goods are most easily shipped in all directions is, for that very reason, one of the best places for the location of factories.

Nearly every manufactured article that men need is made in or near New York, but one of the most

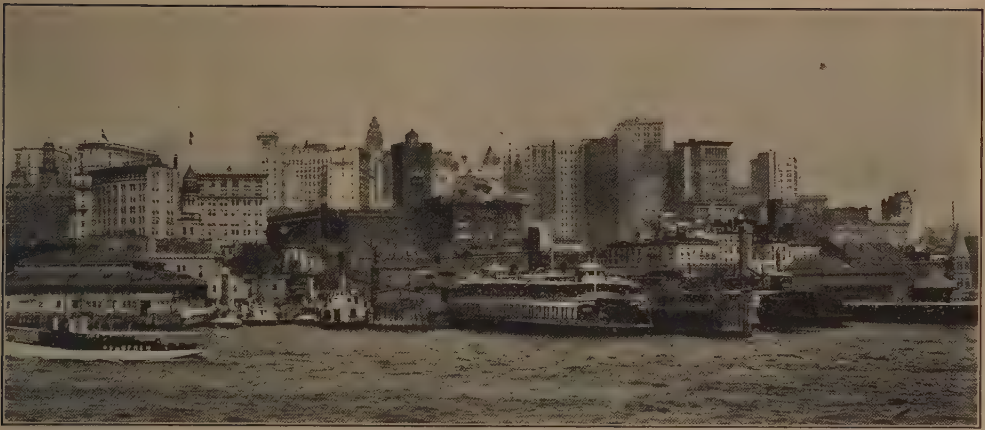


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FIG. 84. — The high buildings, or skyscrapers, on the end of Manhattan Island.

extensive industries is the manufacture of clothing. Cotton and woolen goods are sent here from the factories of New England and other sections to be made into such articles as dresses, men's suits, and underclothing. Large buildings, in which hundreds of men and women are employed, are given up to this work alone.

Iron and coal are so near that the manufacture of iron goods is another great industry. The refining of petroleum is a third, the oil being led, in pipes, from the oil fields of western Pennsylvania to refineries in New Jersey, near the metropolis. The refining of sugar is another immense business in and near New York, as at JERSEY CITY and BROOKLYN.

Being so important a shipping point and manufacturing center, merchants from all parts of the United States come here to buy goods for their stores. This business, called the *wholesale trade*, is a *third* reason why so many people have collected around New York harbor.

At the southern end of Manhattan Island, on which much of New York is built, there are about eight square miles of the city given up almost entirely to the wholesale trade. Since the land is very expensive, as much use as possible is made of every square foot of it. For that reason the buildings are

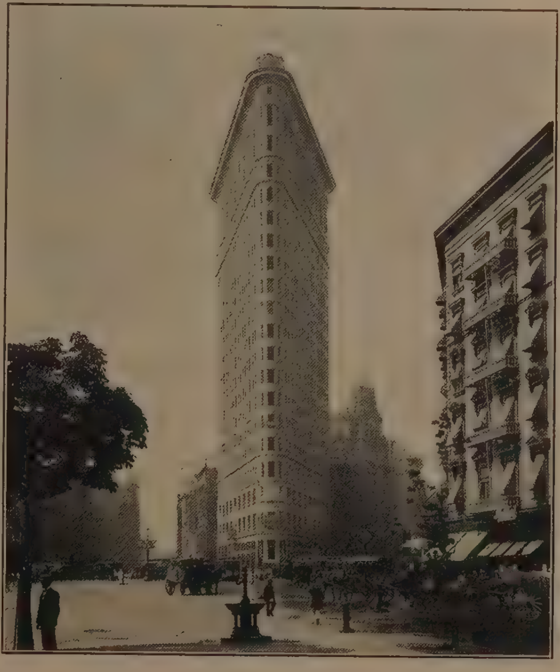

FIG. 85. — The Flatiron building, built with this shape because it occupies the corner where two streets come together. Stores or offices occupy every floor in this tall building.

high (Fig. 84). Many of the stores and office buildings are thirty or forty and one even fifty stories in height. Goods manufactured in the city, together with those that are brought from all parts of the world, are collected in this part of New York. Merchants in Denver, Louisville, St. Paul, Galveston, Indianapolis, and other cities come here to purchase these goods, in order to sell them again in their own stores.

(3) *Life in the great city*

The contrast between life in New York City and upon a farm (p. 93), is striking. On some of the streets scarcely anything but stores can be seen for ten or twelve miles, many of them being small, but some occupying enormous buildings, and employing many hundreds of clerks.

Families whose homes are in the city do not usually occupy a whole house, but often hundreds of people live in one building. Such a structure, called an *apartment building*, may be from six to eight stories high, and some are from fifteen to twenty. They are so arranged that one family occupies only a small part of one floor, called an *apartment*, or *flat*. Other families live above and below, as well as on each side, being separated by only a few inches of brick or boards. Since land is so valuable, sometimes costing scores of dollars a square foot, there is usually neither front nor back yard.

In the poorer sections of the city the people are even more densely crowded. Some of the children have never seen the country, and scarcely any birds, trees, or grass, except possibly in one of the city parks. In these crowded sections there are many foreigners, from all the nations of the earth.

To escape such a crowded city life, tens of thousands of men live in suburban towns, or country homes, from ten to forty miles from their places of business. Every day they spend from one to three hours traveling back and forth. Some ride upon *elevated railways* built in the street, two, three, and four stories above the ground, and supported by iron columns. Others go by train in the *subway*, which extends for many miles underground, and even crosses under the rivers to Brooklyn, Jersey City, and Hoboken.

How different all this is from the country, where only two or three houses may be seen at a time! Where sunlight and fresh air enter one's home from all sides of the building! Where there is plenty of room to play, with green grass, large trees, and singing birds in the yard! No wonder that people living in great cities are anxious to visit the country, the mountains, the lakes, and the seashore, during a few weeks in the summer!

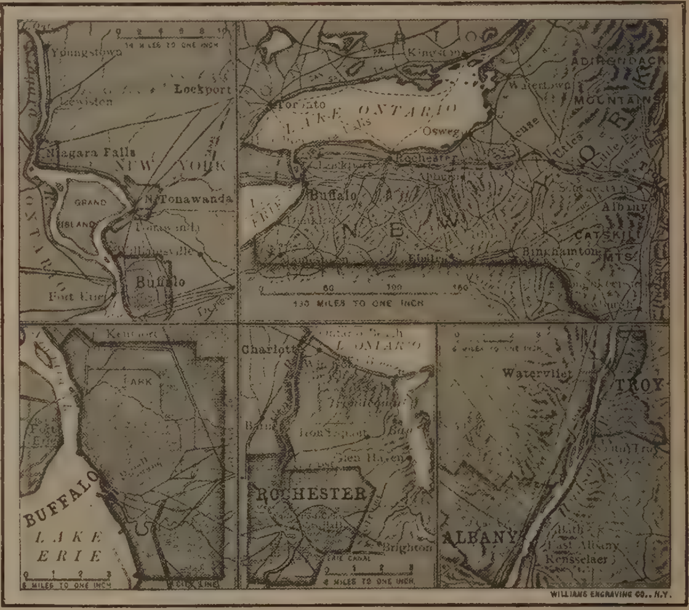

FIG. 86. — Map showing location of Buffalo, Rochester, and Albany.

2. Buffalo and cities along the Erie Canal

Most of the other large cities in New York State are found along the water and rail route from New York City to Lake Erie (Fig. 80). The most important of these is BUFFALO (Fig. 86), on Lake Erie, at the western end of the Erie Canal. Before the canal was built, Philadelphia was larger than New York, and Buffalo was only a village. But both New York and Buffalo have had a very rapid growth since 1825, when the canal was completed.

Since the canal (Fig. 87) is only seventy feet wide, and seven feet deep, all freight coming in lake steamers from the West, and bound farther by water, must be unloaded at or near Buffalo, and placed in *canal boats*. These clumsy looking boats are made with broad, flat bottoms, in order that they may carry heavy loads without sinking too deep into the water. They are drawn by horses or mules that walk along the *towpath* at the side.

Buffalo is a great railway center, as well as an important lake port. Here immense quantities of grain, flour, lumber, and iron from the West are transferred from lake vessels to railways as well as to canal boats; and coal and manufactured goods shipped westward. There is also much manufacturing of many kinds (p. 59).

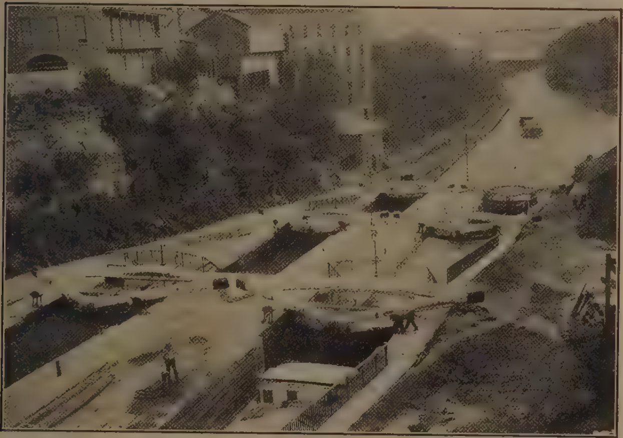

Fig. 87. — Locks in the Erie Canal. The canal boats are drawn into one of these spaces, which is then filled with water, raising the boat to a higher level. This is then repeated until the boat is raised to the level of the canal above the locks. Or, if a boat is going the other way, it is lowered in the locks by letting the water run out.

Niagara Falls (Fig. 68), which are about twenty miles from Buffalo, supply electric power for use in lighting the city and in running street cars and factories. Much use is made of this electric power near the Falls, as at the city of NIAGARA FALLS, which has become an important manufacturing center. The Niagara power is used for running electric cars between Buffalo and Niagara Falls and between Buffalo and Lockport. This electric power is carried by wire even as far east as Syracuse. How far is that?

Name other cities along the Erie Canal route (Fig. 80), and recall what has been said about them. Notice especially LOCKPORT. At this point the land has a decided slope, so that the canal boats have to be raised and lowered, according to the direction they are going. This is done in inclosed parts of the canal, called *locks* (hence the name of the city), into one of which a boat enters (Fig. 87). Then, by turning in more water, or allowing some to run out, the boat is either raised or lowered at will. A canal boat thus enters one lock after another until it is raised to the top of the slope if going west, or lowered to the base if going east.

Education in New York State

New York State is prominent in education. Columbia University is located in New York City; and at ITHACA, in the central part of the state, is Cornell University, beautifully situated on the hillside above Lake Cayuga (Fig. 88). Both of these should be associated with Princeton University in New Jersey, and with Harvard and Yale universities in New England, as among the most important educational institutions in the country. North of New York City, on the Hudson River, is West Point, the place where the government school for the training of army officers is located. At POUGHKEEPSIE, also on the Hudson, is Vassar College, one of the leading colleges for women, like Smith and Wellesley in Massachusetts, and Bryn Mawr near Philadelphia.

Rank of New York State

Largely on account of the enormous population of New York City, with its extensive manufacturing and great wealth, New York is called the *Empire State*; for it ranks first in the Union in population, manufacturing, commerce, and wealth (Figs. 247 and 278).

The leading cities southwest of New York as far as Richmond are located along the Fall Line. Name them (Fig. 66).

3. Philadelphia and neighboring cities

The greatest of all is Philadelphia (Fig. 89), which has over 1,500,000 inhabitants, and ranks third among the cities of the United States. As in the case of New York, other important cities are near by, the largest being Trenton and Camden, in New Jersey; Chester and Norristown, in Pennsylvania; and Wilmington, in Delaware.

Lines of steamships (Fig. 89) run from Philadelphia to the leading seaports of the United States and foreign countries, carrying both passengers and a multitude of products. Because of its nearness to the coal fields, Philadelphia has become a great shipping point for coal. The coal and iron have made possible the manufacture of cars, heavy machinery, and steel ships (Fig. 90) at Philadelphia and Wilmington. Philadelphia is a great textile manufacturing center, making especially woolen goods; there is much manufacturing of clothing; and in carpet manufacture this is the most important city in the country.

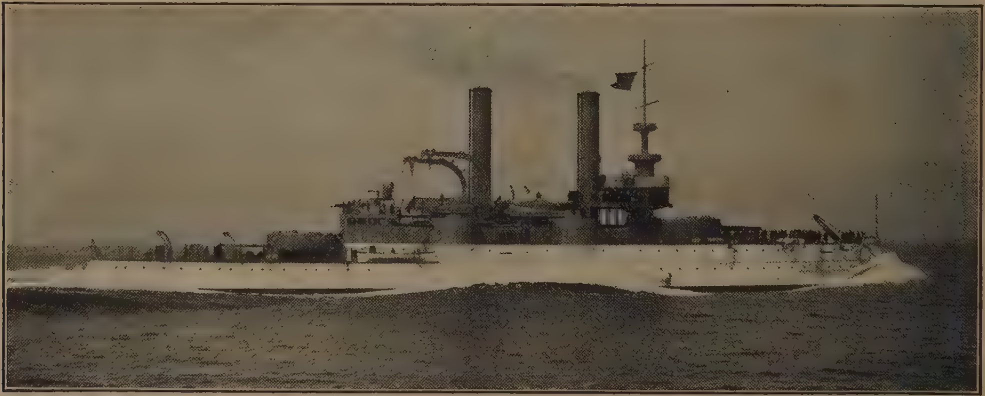

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Fig. 90. — The Battleship *Iowa* going at full speed. This was built in the shipyards below Philadelphia.

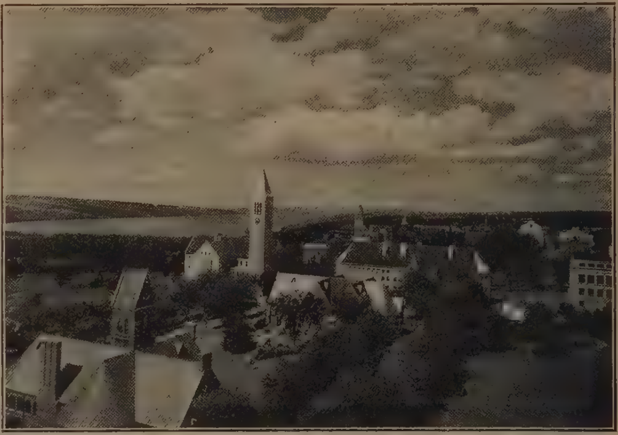

Fig. 88. — A view of Cornell University with Lake Cayuga in the distance.

Philadelphia is called the *Quaker City*, because it was founded by William Penn and other Quakers, many of whose descendants still live there. It was the home of Benjamin Franklin; and at one time, before Washington was built, it was the capital of the United States. Independence Hall, in which the Declaration of Independ-

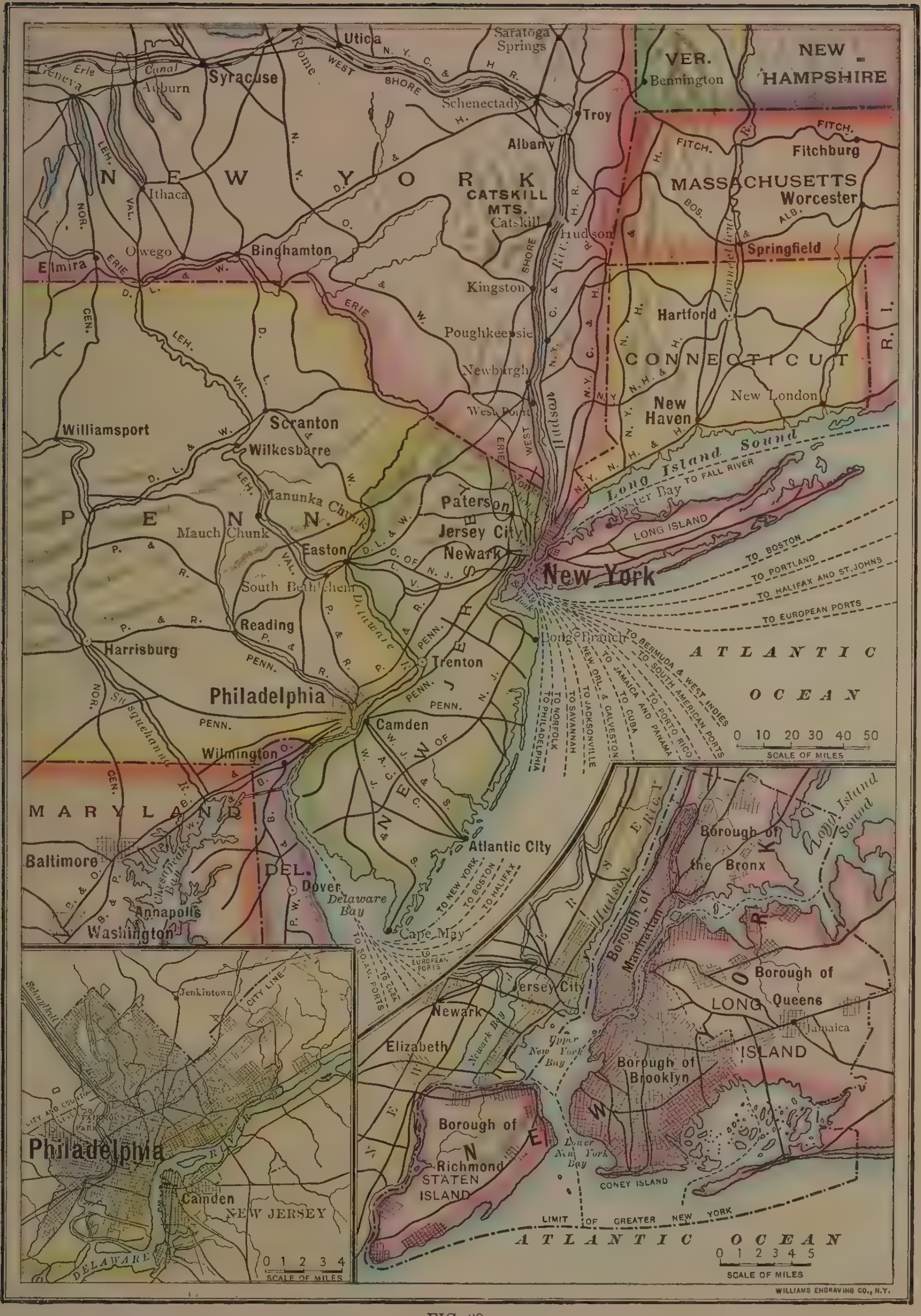

FIG. 89.
Map to show the location of New York City, Philadelphia, and Baltimore.

ence was signed, and the Constitution of the United States drawn up, is still standing there (Fig. 91). The leading educational institution of the city is the University of Pennsylvania.

4. Other cities in Pennsylvania

Pennsylvania has the city of ERIE, on Lake Erie, corresponding to Buffalo in New York; but, while it is an important shipping and manufacturing center, it is much smaller than Buffalo. Two reasons for this are that it lacks water connection, across Pennsylvania, with the Atlantic coast, and that it is not close to the eastern end of the lake. Goods from the Great Lakes that are bound for the coast are naturally carried eastward by water as far as Buffalo, before being transferred to the railroad.

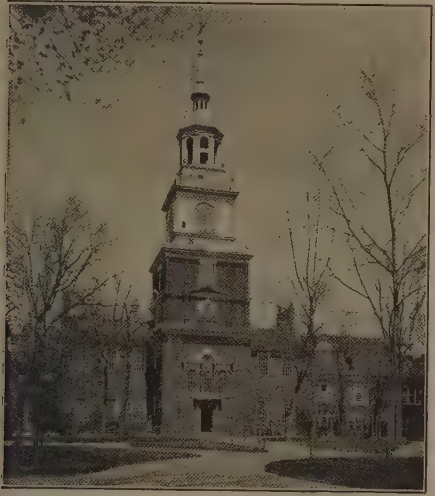

FIG. 91. — Independence Hall, in Philadelphia.

The city in Pennsylvania which ranks next to Philadelphia is PITTSBURGH, to which Allegheny is now united, making it the eighth city in size in the United States. Located at the point where the Allegheny and Monongahela rivers unite to form the Ohio River, Pittsburgh has extensive water connections. It is a center for the manufacture of iron and steel, and articles made from them. Indeed, it is the greatest center for such work in the country. Other cities in this locality, like WHEELING in West Virginia, being in the midst of the coal and iron region, are also extensively engaged in manufacturing.

5. Baltimore

At the head of Chesapeake Bay, in Maryland, is BALTIMORE, the seventh city in size in the United States. It has a good harbor, is connected with the West by trunk railways (Fig. 92), and easily receives coal from Pennsylvania, Maryland, and West Virginia. For these reasons it has become noted for manufacturing and shipping.

Baltimore is the seat of Johns Hopkins University; and a few miles south, at ANNAPOLIS, is the United States Naval Academy, which prepares officers for the navy, as West Point prepares them for the army.

6. District of Columbia

Southwest of Baltimore, on the Potomac River, is the District of Columbia, where WASHINGTON, our national capital (Fig. 92), is situated. This site was chosen for the capital long ago, when this was near the center of the settled part of the country. On Figure 246 you will find a star showing where that center is now. The District of Columbia does not form a part of any state, but is controlled directly by the national government.

Washington is unlike other cities in two respects. In the first place, since it was certain that it would one day be very large, it was carefully planned, with wide streets and many parks. For that reason it is more beautiful than most cities. In the second place, the people, unlike those of other large cities, are not chiefly interested in manufacturing and commerce. Here reside the President and his cabinet, members of Congress, and the foreign ambassadors and other representatives of the great nations of the world. Besides these there are many thousands of men and women at work in the different departments of the government. The chief buildings, therefore, are not factories and private offices, but government buildings (Fig. 93).

The mouth of Chesapeake Bay has already been referred to as the site of important harbors. The principal city at this point is NORFOLK, a manufacturing and shipping center for cotton, lumber, iron, and other products. It is one of the leading Southern ports, and has been advancing very rapidly. Near by is PORTSMOUTH, where there are shipyards belonging to the United States. Shipbuilding is an important industry at NEWPORT NEWS, also.

7. Cities of Virginia

The winter climate in this section is so mild that many people from the North go there for the winter season. Norfolk, Newport News, and Old Point Comfort are popular winter resorts.

The largest city of Virginia is RICHMOND, the capital of the state, at the head of tide water on the James River. It is important as a tobacco market, and as a rapidly growing manufacturing center. Other prominent cities in the state are ROANOKE, LYNCHBURG, and DANVILLE.

Review Questions

1. What mountains are there in the Middle Atlantic States, and in what parts are they? 2. What are the surface features east of the mountains? 3. What is meant by the Fall Line, and why is it important? 4. What facts can you give about the slope west of the mountains? 5. What rivers have cut passageways across the Appalachians? Of what importance are these gateways? 6. State the effects of the Great Glacier on this group of states. 7. The effects of the sinking of the coast. 8. Describe the climate. 9. Tell about the lumbering and related industries. 10. What kinds of fishing are there? 11. What about the oyster industry? 12. Where are the best farming sections? 13. What can you tell about the dairying? 14. About the tobacco

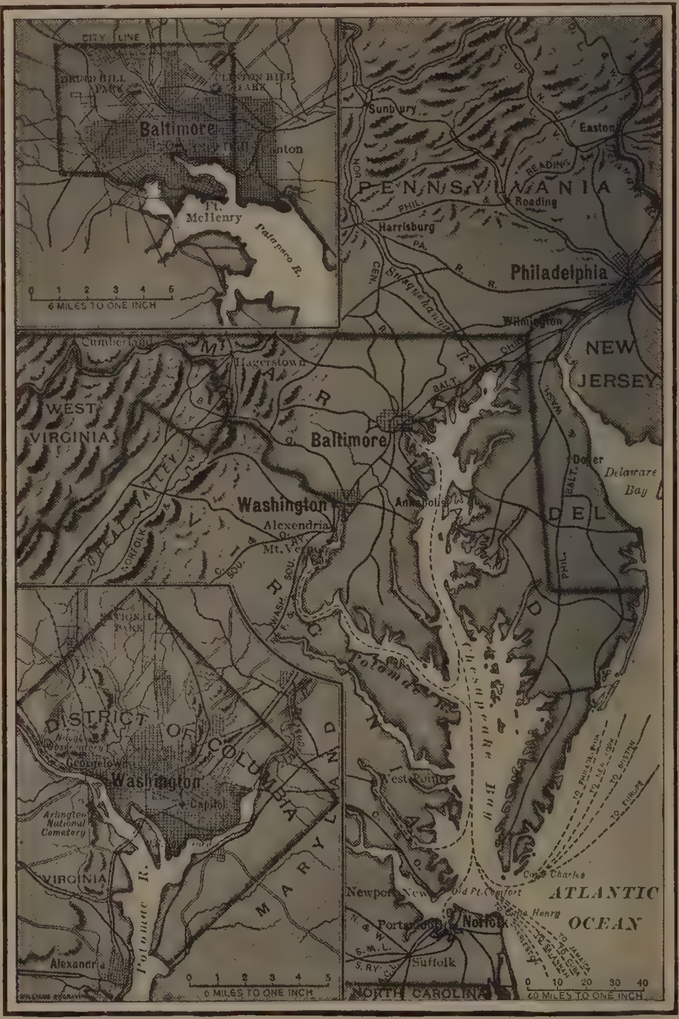

FIG. 92. — Map to show the location of Baltimore and Washington.

industry? 15. What sections are noted for fruits and vegetables? 16. What about the market for these products? 17. What other farm products are raised in these states? 18. Where is salt found? How is it obtained? 19. Where is coal found? 20. How was anthracite formed, and what is its special value? 21. Describe the method of mining coal. 22. Of preparing it for market. 23. In what ways is coal used? 24. Where are oil and natural gas found? 25. How have these been formed? 26. How are they obtained from underground? 27. What products are made from the crude oil? 28. How is the oil handled? 29. Where is iron ore found in these states, and why is it very important? 30. Describe it; also, tell how it was formed and how it is mined. 31. What other important mineral products are found in these states? 32. How is iron made from ore? 33. What are the kinds of iron? 34. Name and locate the principal iron-manufacturing centers. 35. What can you tell about the manufacture of glass? 36. Pottery? 37. Brick? 38. Cement? 39. What other kinds of manufacturing are there? 40. What about the extent of commerce in these states? 41. Where are the harbors? 42. What connections are there with the West by water? 43. By rail? 44. What is the population about New York harbor? 45. Give several reasons for so great a population here. 46. Describe life in New York City. 47. Why are there so many cities along the Erie Canal? Locate each. For what is each important? 48. Name and locate the leading educational institutions in New York State. 49. What is the rank of New York as a state? 50. For what are Philadelphia and neighboring cities important? 51. Name and locate other cities in Pennsylvania. 52. State the principal facts about Baltimore. 53. Where is the District of Columbia? For what is it important? How does Washington differ from other large cities in the United States? 54. Name and locate the larger cities of Virginia. What can you tell about each?

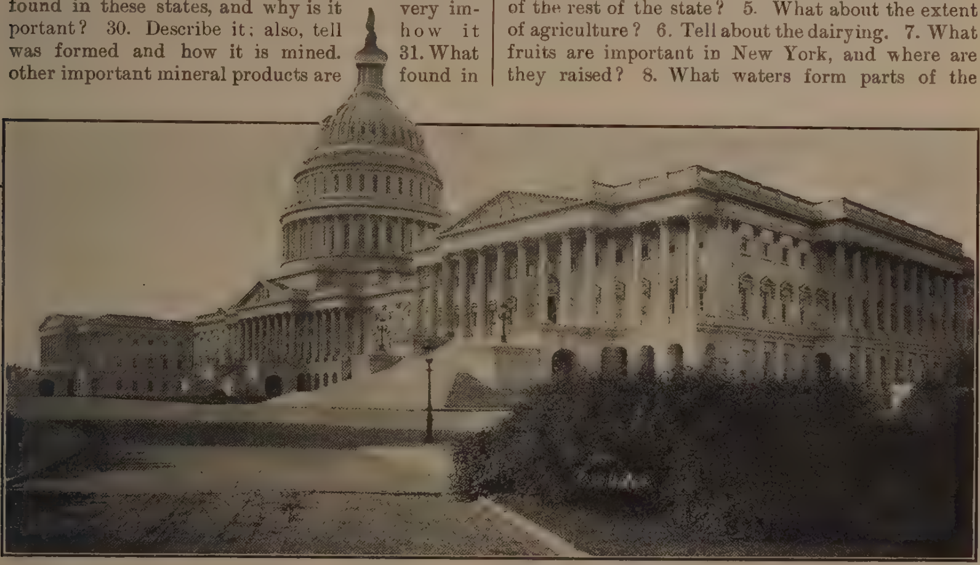

FIG. 93. — The National Capitol Building at Washington.

Review Questions by States

New York (N.Y.). 1. Where are the mountains? 2. What are their names? 3. Why are forests extensive here? Why is there little agriculture among the mountains? 4. What about the surface features of the rest of the state? 5. What about the extent of agriculture? 6. Tell about the dairying. 7. What fruits are important in New York, and where are they raised? 8. What waters form parts of the boundary of the state? 9. Into what rivers do the lakes empty? 10. What rivers drain New York? 11. State clearly the importance of the Erie Canal. 12. Which cities mentioned in the text are on the canal? Which are on the Hudson? 13. Compare New York in size with all of New England. 14. Draw a map of New York like that of Maine (p. 47). When studying each of the other states, do the same for it.

New Jersey (N.J.). 15. Why should peaches and grapes grow better in New Jersey than in New England? 16. Name and locate each of the cities mentioned in the text. 17. For what is each important? 18. In what ways are some of the largest cities dependent upon the products of Pennsylvania? 19. Add together the populations of all the cities within about twenty miles of New York.

Pennsylvania (Pa. or Penn.). 20. Where would you look for the best farm land? 21. The principal forests? 22. The leading coal mines? 23. Where are the principal cities? Why located where they are? 24. Why are there fewer lakes in Pennsylvania than in New York? 25. Should you expect to find fewer waterfalls also (p. 50)? 26. Why, then, is manufacturing so important in this state? 27. What kind of manufacturing is especially important? Why? 28. What advantage do you see in the position of Pittsburgh? 29. By or through what states would one pass in going by boat from Pittsburgh to the Gulf? (See map, Fig. 40.) 30. Measure the length and width of Pennsylvania. Also find its area (Appendix, p. 426). 31. Is Pennsylvania larger or smaller than New York? Virginia? New England? 32. Is it larger or smaller than the state you live in? How much?

Delaware (Del.). 33. Which is the principal city in this state? 34. For what is it noted? 35. Why is it especially well situated for that industry? 36. Compare it with Albany in size. 37. The principal industries of the state are fruit raising and farming. What two reasons can you give for this fact?

Maryland (Md.). 38. In which section is farming most important? Why? 39. What products can you expect from the mountains? Why? 40. Notice how branching Chesapeake Bay is. Why is it so irregular? 41. What influence must this have upon the number of oysters found there? 42. Why is Baltimore favorably situated for receiving coal and iron from Pennsylvania? 43. For canning fruit, vegetables, and oysters? 44. What might be the effect upon the growth of Baltimore if the land should rise, so that Chesapeake Bay disappeared and the Susquehanna flowed through it? 45. Compare the size of Baltimore with that of Boston.

Virginia (Va.). 46. In what other state is the capital the most important city? 47. Locate the fertile Great Valley that is found in Virginia (Fig. 92). 48. What kinds of agriculture are carried on here? 49. What river separates Virginia from Maryland? What river crosses the middle of Virginia? 50. Compare Richmond in size with Albany. 51. How does Virginia rank in iron production (Fig. 270)? 52. Of what importance are the branching bays that enter Virginia? 53. If goods are to be shipped across the ocean from Kentucky (see map, Fig 40), is it nearer to send them to Norfolk or to New York?

West Virginia (W. Va.). 54. What disadvantage is it to this state that it has no seacoast? 55. How could we reach the ocean by water from West Virginia? 56. Where is the largest city? Why there? 57. How does this city compare in size with Pittsburg? 58. Should you expect to find much forest in this state? Why? 59. Much farming? 60. Coal, iron, petroleum, and natural gas are found here. Of what value are these? 61. What mountain range lies on the eastern boundary?

General Review Questions

62. Describe the surface features of this group of states from the relief map (Fig. 65). 63. Describe the differences in climate in the different parts. 64. State the principal industries of the Middle Atlantic States. 65. Make a list of the ten largest cities. Add their populations together, and compare the result with the ten largest in New England. (See Appendix, pp. 427–428.)

Suggestions

1. Collect pictures of Niagara Falls. 2. Examine a live oyster, or clam, to see what holds the two parts of the shell together. What is the use of the shell? 3. Find where the canned fruits and vegetables in a neighboring grocery store have come from. 4. Make a collection of the kinds of coal for the school; of some coke and iron ore. 5. In small bottles collect products made from petroleum. 6. Collect samples of cast iron, wrought iron, and steel. 7. Estimate, by use of the map (Fig. 40), the distance by water from New York City to Duluth. 8. Visit a canal and examine a lock. 9. Make a toy canal having a lock in it. 10. Give reasons why freight rates are cheaper on canals than on railways. 11. Can you give a reason why the Erie Canal should have reached to Lake Erie instead of to Ontario? 12. Write a composition, giving the reasons why one might prefer to live in a large city; or in the country. 13. Collect pictures of scenes in a large city; in the country. 14. Make a drawing of these states, including the principal rivers and cities. Locate the capitals.

4. Southern States

Map Study

1. In what three parts of this section are there mountains? 2. What are the names of the mountains? 3. Which states have none? 4. What are the principal tributaries to the largest river? 5. Through or on the borders of what states would you pass in going by water from New Orleans to Chattanooga, in Tennessee? 6. What natural boundaries do you find for this section? 7. Compare the coast with that of New England. Why the difference (p. 12)? 8. Why are there so few lakes (p. 9)? 9. The rivers that rise in western Texas — as the Colorado — are often quite dry in the western part of their course. Why (p. 30)? 10. Name the states in this group. 11. Find the capital of each. 12. Which of the states have a seacoast? 13. Which have none? 14. Which border the Mississippi? 15. Which drain into that river? 16. What reasons can you suggest for the fact that the largest city is near the mouth of the Mississippi?

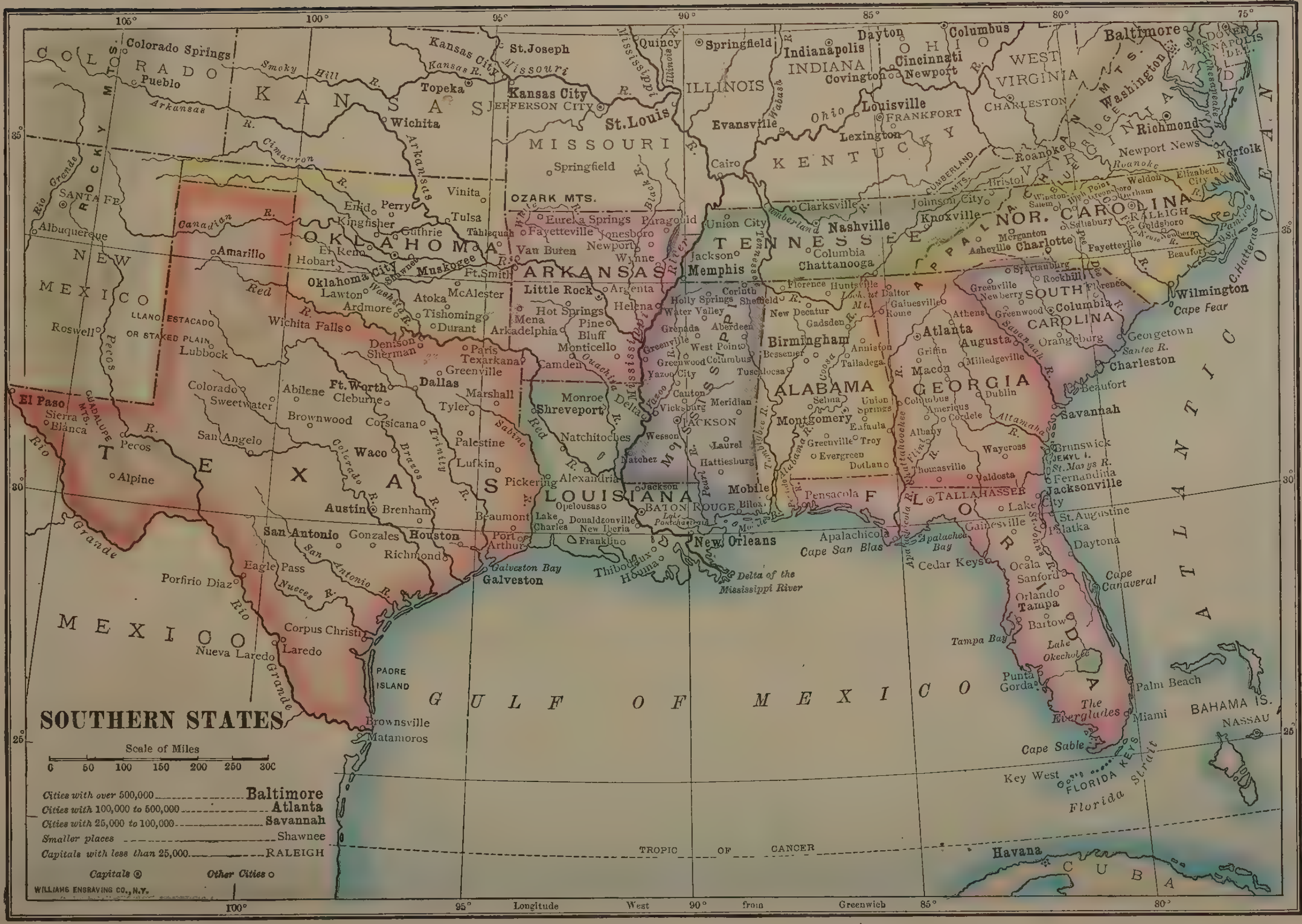
SOUTHERN STATES
Scale of Miles
0 50 100 150 200 250 300
Cities with over 500,000 Baltimore
Cities with 100,000 to 500,000 Atlanta
Cities with 25,000 to 100,000 Savannah
Smaller places Shawnee
Capitals with less than 25,000 RALEIGH
Capitals ◎
Other Cities ○
WILLIAMS ENGRAVING CO., N.Y.
COLORADO
KANSAS
MISSOURI
ILLINOIS
INDIANA
OHIO
WEST VIRGINIA
VIRGINIA
KENTUCKY
TENNESSEE
NOR. CAROLINA
SOUTH CAROLINA
GEORGIA
ALABAMA
MISSISSIPPI
LOUISIANA
ARKANSAS
OKLAHOMA
TEXAS
NEW MEXICO
FLORIDA
MEXICO
CUBA
BAHAMA IS.
GULF OF MEXICO
ATLANTIC OCEAN
TROPIC OF CANCER
Longitude West from Greenwich
105° 100° 95° 90° 85° 80° 75°
35° 30° 25°

FIG. 94.

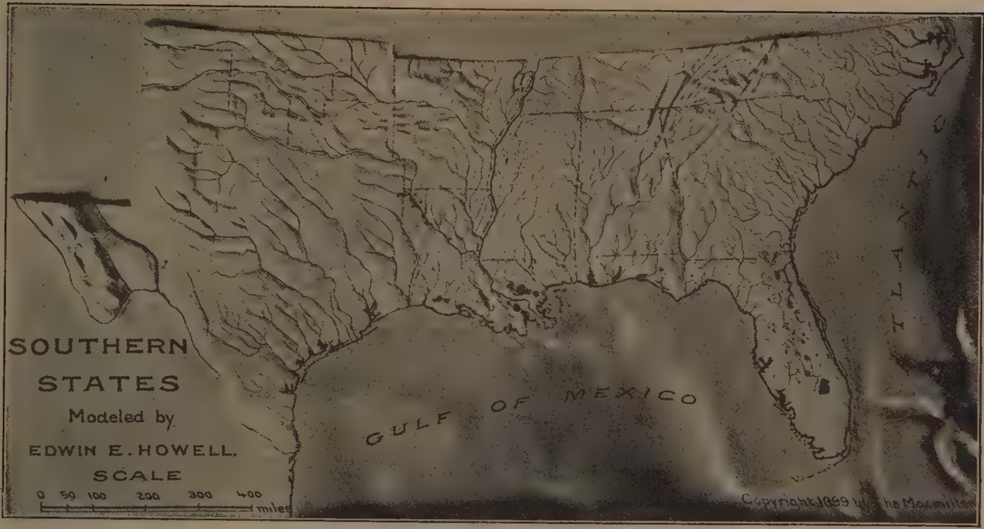

FIG. 95. — Relief map of the Southern States.

Surface features

1. Resemblance of northeastern part to the country farther north

Figure 94 shows that the Appalachian Mountains continue southwestward as far as Alabama. In what states are they found? These mountains are generally low, as they are in the Middle Atlantic States; but in western North Carolina and eastern Tennessee they are much higher (Fig. 96). In fact, the highest peak east of the Mississippi River is Mount Mitchell in North Carolina. It rises 6711 feet, or 432 feet higher than Mount Washington in New Hampshire.

East and southeast of the Appalachians the surface features resemble those of the Middle Atlantic States. First there is the Piedmont Plateau, which slopes gradually from the base of the mountains, where it is about 1000 feet above sea level, to the Fall Line. Trace this line in Figure 66. The Coastal Plain begins at the Fall Line at an elevation of 100 to 500 feet, and slopes gently toward the sea. It includes all of Florida, as well as parts of several other states. Name them.

As in Pennsylvania and West Virginia, there is a rough plateau along the western base of the Appalachians. As in those states, also, this plateau is

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FIG. 96. — Asheville, situated in a valley among the high mountains of western North Carolina.

deeply cut by the river valleys, and is so rugged that it is still covered by extensive forests and has few inhabitants. It gradually becomes lower and more regular farther west, until it merges into the broad and fertile plains of the Mississippi Valley.

2. Level character of most of this region

The mountains and plateaus just mentioned include only a small part of the Southern States. The remainder consists mainly of plains (Fig. 97). The Coastal Plain extends westward along the coast of the Gulf of Mexico, and is very level. So also are the delta and flood plains of the Mississippi River. These plains rise toward the north and west until they merge into the plains and prairies that lie between the Appalachian and Rocky Mountains. Toward the north they reach no great height, but in western Texas they become high plateaus, from 4000 to 5000 feet above the level of the sea. This plateau region is a part of the Great Plains of the West.

3. Where the mountains are

In only a few places are these vast plains broken by mountains. In northwestern Arkansas, for instance, are the low Ozark Mountains; and southwest of these is the mountainous country of eastern Oklahoma. From here low mountains extend, with some breaks, to the central part of Texas. In the extreme western part of Texas, also, low spurs of the Rocky Mountains are found. Aside from the Appalachians, and these few small mountainous areas, the surface of the Southern States is mainly made up of plains, which are usually very level.

4. The coast line

The coast is much more regular than that of New England. Give the reason for this as stated on page 12. There are numerous bays, but none so large as Chesapeake Bay and other bays in the North. Sand, drifted by waves and currents, has been built into sand bars, which often partly shut in the bays, and thus make the coast more regular.

The irregular coast of southern Florida is due to the work of coral polyps, which live in countless millions in the warm waters of the Gulf Stream (Fig. 313). These polyps have built the limestone rock of which the southern part of the Florida peninsula is composed. They have also made the many reefs and small islands, or *keys*, that lie just south of Florida.

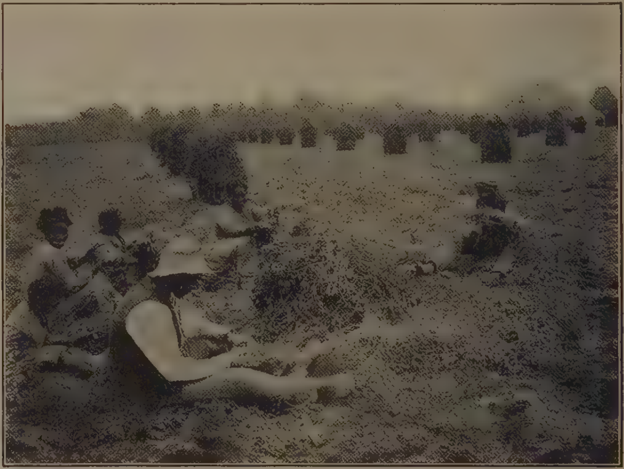


Fig. 97. — A view in the Southern States. Much of the land is as level as this. The crop raised in this field is the peanut, which the boys and girls are picking from the roots of the peanut plants.

The climate

The low plains of the Southern States lie so far south that the climate is everywhere warm, and the damp sea winds bring an abundant rainfall to most parts. During the cold, disagreeable Northern winter, the weather in the South is mild, like spring and autumn in the North. Flowers are in blossom and birds are singing, many of the birds being Northern species, that have migrated there for the winter. Large numbers of Northern people also go South to spend the winter. Among the principal winter resorts in Florida are JACKSONVILLE, TAMPA, and ST. AUGUSTINE, one of the early Spanish settlements.

The climate is cooler in the mountains, where there are many pleasant summer resorts, as in the mountains of the Northern States. The best-known mountain resort is ASHEVILLE, in North Carolina (Fig. 96).

The western part of Texas has a different climate from the other parts of the South; for it is too far from the sea to be reached by damp winds, and therefore receives little rain. As one travels westward from the Gulf of Mexico, he finds first dense forests; then come plains with scattered trees, especially the live oak; beyond this are broad prairies without trees, but with extensive cotton fields. Next a section is reached which is too dry for cotton; and this country, fitted only for ranching, stretches westward for several hundred miles.

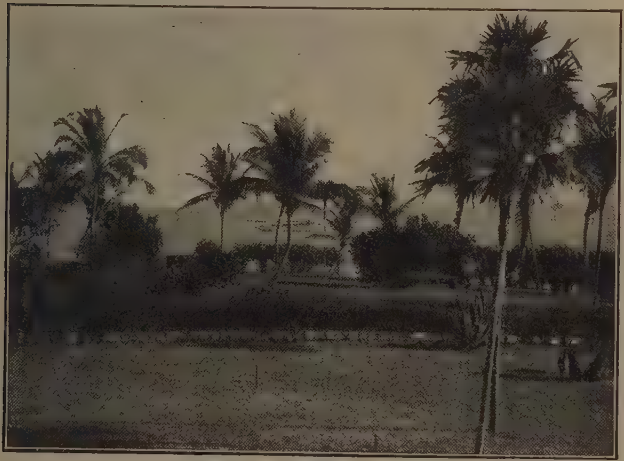


FIG. 98. — A view at Miami in Florida, showing the palms and other vegetation of a warm climate.

Lumbering

1. Kinds of trees, and their uses

The South is now the greatest lumber section in the country. There are immense tracts of forest on the Coastal Plain, on the river flood plains, and among the mountains. Among the forests are many trees either unknown or uncommon in the North, some of them, such as the magnolias, bearing large, sweet-scented flowers. Another is the live oak, whose green leaves remain on the tree all winter, and whose hard wood is highly valued for shipbuilding.

The long-leaved or hard pine, often called the *Georgia pine*, is a very valuable wood, and is much used for floors. This lumber is sent to all the cities of the North. It is shipped from the coastal cities of CHARLESTON, S.C., SAVANNAH and BRUNSWICK, Ga., JACKSONVILLE and PENSACOLA, Fla., and MOBILE, Ala., as well as from other seaports.

While the pine thrives on the low, sandy plains, the hardy oak and other valuable hard-wood trees are found upon the plateaus and upon the mountains (Fig. 99). Quantities of hard wood are shipped from MEMPHIS and from other points.

2. Method of lumbering

The method of lumbering in the South is very different from that of New England (p. 34). In the South there are no heavy snows to level up the uneven ground and to cause floods in the streams. Therefore, logs cannot be floated down to tide water by means of spring freshets. On this account the sawmills are located in the midst of the forests, if possible on the river banks. To them the logs are brought, either by water, by wagon, or by train (Fig. 100), and then sawed into lumber.

Fishing

In this section there are no fishing banks where such food fish as cod and halibut live. But in the rivers, along the coast, and in the bays, are excellent food fish which are caught mainly for use in the South.

There is also extensive oyster fishing in the shallow bays, as in Mobile Bay, for instance; and in southern Florida there is sponge and turtle fishing. The sponge grows in the warm, shallow waters of the coral reefs; and the immense sea turtle swims about on the surface of the ocean. The alligator, whose skin is made into the valuable alligator skin leather, is also found in Florida.

Agriculture

1. Its rank as an industry

With its fertile soil and favorable climate, the South has naturally become a great agricultural country. It is far better suited to farming than either the Middle Atlantic or the New England States. Many people are engaged in other occupations, it is true, but farming is the leading industry.

2. Cotton

(1) *Its relation to slavery*

The crop that exceeds every other in value, in the South, is cotton. The early colonists soon discovered that cotton could easily be raised here, and that there was a ready market for it abroad. The cotton fields, or *plantations*, were very large, and there was a vast amount of work in planting and picking the cotton, and in separating the fiber from the seed. This called for a great many laborers, — far more than could be found there.

In those days it was common for people to own slaves, and negro slaves were offered for sale in many parts of the world. Since they were found to be well suited for work in the cotton fields, they were brought to our country for that purpose. In this way it came about that cotton had much to do with the spread of slavery in the Southern States.

FIG. 100. — Lumbermen loading logs on a train in the forest of eastern North Carolina.

FIG. 99. — Lumbermen at work cutting hard-wood logs in the mountains of western North Carolina.

(2) *The amount produced*

In 1910 the Southern States produced about 11,400,000 bales of cotton, each weighing a little over 500 pounds. Of this, about 8,000,000 bales were shipped abroad, especially to England. The remainder was manufactured at home, mainly in New England and the South. In the same year the entire world produced a little less than 20,000,000 bales, which makes it clear that the United States furnishes much more than half of all the cotton grown. Since so much of the clothing worn by men and women of all nations is made of cotton, we see that one of the chief industries of the Southern States is to help clothe the peoples of the world.

(3) *The climate cotton requires*

Cotton requires a rather fertile soil and a long, warm summer. These conditions exist throughout the region marked as the *cotton belt* in Figure 253, but they are wanting in the

North, where the summers are altogether too short.

(4) *Method of raising and marketing it*

The cotton seeds are planted in the spring, in rows about three feet apart, and the weeds are kept out until the plants are nearly grown. These reach a height of two or three feet, and blossoms appear that produce a pod or boll in which the cotton and cotton seed are contained. When ripe the pod bursts open, making a white, woolly ball, known as *cotton*, which resembles in appearance the downy substance in the thistle, or in the pod of the milk-weed (Fig. 101).

When a great number of these pods have opened, a cotton plantation presents a beautiful sight, — much like a field flecked with snow (Fig. 102). Then the busy season for the pickers begins. As many as two or three hundred men, women, and children may assemble in one field, carrying bags to be filled with cotton, singing and chattering the livelong day.

When plucked from the boll, the cotton is attached to seeds, and these must be removed before the cotton can be of use. The seedless cotton is tightly pressed into bales which are covered with coarse jute bagging, bound with iron bands, and shipped away to the warehouses, to be sold.

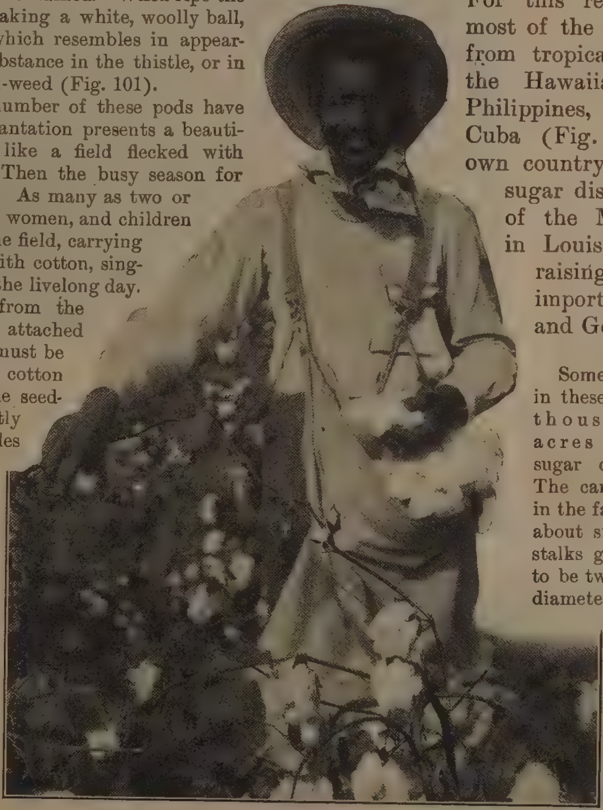


FIG. 101.—Picking cotton on a Southern plantation. The white, woolly cotton is seen on the plant in the lower right-hand corner.

3. Sugar cane and sugar

Sugar cane is a second important crop that is confined to our Southern States.

(1) *Plants from which sugar is obtained*

There are a number of plants from whose sap sugar is made. One of these, the sugar maple, has already been mentioned (p. 41); another is the sugar beet, raised in great quantities in Europe, and also, of late, in many of our states. This beet is now a very important source of sugar, because it can be raised in a cool, temperate climate. For a long time, however, the principal source of sugar has been the sugar cane, a plant that looks somewhat like corn (Fig. 103).

(2) *Where sugar cane is grown*

Sugar cane requires a fertile soil, and grows only in warm regions where there is little or no frost, even in winter. For this reason most of the cane sugar comes from tropical lands, such as the Hawaiian Islands, the Philippines, Porto Rico, and Cuba (Fig. 255). In our own country the most noted sugar district is the delta of the Mississippi River in Louisiana; but sugar raising is increasing in importance in Texas and Georgia.

(3) *How it is cultivated*

Some of the plantations in these states have several thousand acres in sugar cane. The cane is planted either in the fall or spring, in rows about six feet apart. The stalks grow in the summer to be two or more inches in diameter, and reach such a height that a man riding through a field on horseback may be entirely hidden from view. The cane is ready to be cut in the fall, after the middle of October. As soon as the stalks are cut, they are drawn to the sugarhouse in wagons, or, on the larger plantations, in railway cars (Fig. 104).

(4) *How the sugar is obtained*

In the sugarhouse the cane is ground between rollers in order to squeeze out the juice. The waste cane, left after the juice is pressed out, is used as a fuel to run the engines of the sugarhouse; the juice or sap is placed in large vats and warmed to evaporate the water in it and to crystallize the sugar. This leaves two products, a thick black molasses and brown sugar. Some large sugarhouses produce as much as 14,000,000 pounds of sugar in a year.

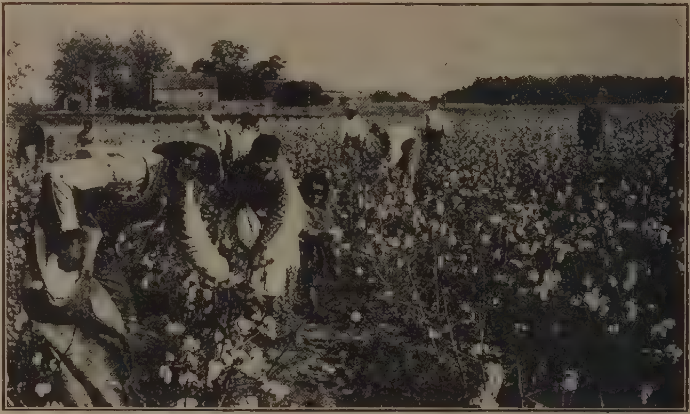


Fig. 102.—A cotton field on a Southern plantation in the picking season.

The crude, brown sugar is sent from the sugarhouse to some refinery, either in New Orleans or in the North. At the refinery it is changed to white sugar, from which the various grades of granulated, powdered, and lump sugar are made. In changing the brown to the white sugar, burned bones, called boneblack, are used to filter out the impure parts. The bones are obtained from Chicago, and elsewhere, where large numbers of animals are killed for meat.

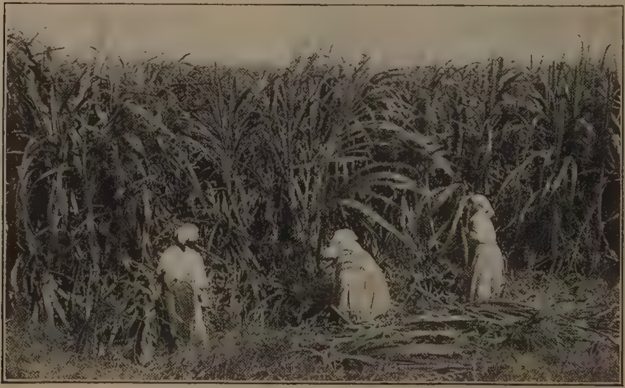


Fig. 103.—Cutting the sugar cane on a plantation in Louisiana.

The molasses is used for various purposes, some of it being manufactured into sirup and molasses for the table, and some of it into rum. Molasses is a by-product, like sawdust in a lumber mill, and is not of great value to the sugar raiser.

4. Rice

(1) Its importance as a food

Rice, a third valuable crop in the South, is one of the most important foods in the world; it is, in fact, the chief food of some nations, such as the Chinese. It is not eaten so extensively in our country, but still we consume large quantities,—far more, indeed, than we raise.

(2) Why we may raise more in the future

One reason why we have raised too little rice for our use, is that we have not had the proper conditions for its growth. Rice requires a warm climate and a damp, even swampy soil. The climate is suitable in many parts of the South, but the wet soil is not so common. On the Coastal Plain and river flood plains, from the Carolinas to Texas, there is some such land, and there rice culture has long been carried on, the principal districts being South Carolina and Louisiana (Fig. 105).

Recently the area of rice production has been greatly increased by irrigation. By leading the water from streams, or springs, it has been found possible to make the soil as wet as necessary even on some of the higher, well-drained plains. With irrigation, rice culture may be carried on over much of the warmer part of the South. Some day, therefore, our country may supply all the rice we need, and even have some to spare. Louisiana, Texas, and Arkansas produce most of the rice now raised in the country, though some comes from other Southern States.

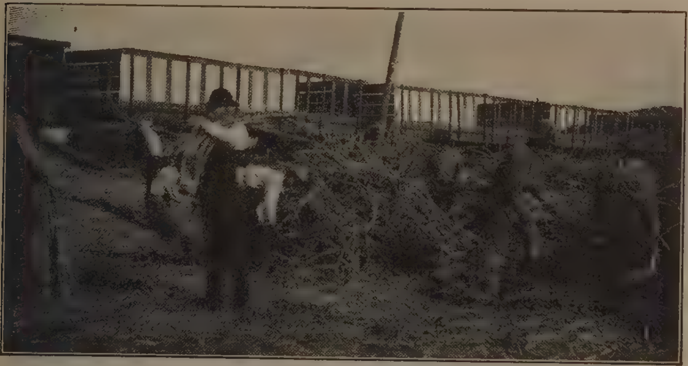


FIG. 104. — Carrying the sugar cane to the cars which will take it to the sugarhouse. A scene on a Louisiana plantation.

(3) *Method of cultivating and preparing for market*

To raise rice the ground must first be prepared, as for other grains. After the seeds are planted, the fields are flooded. As the plant grows, it forms a slender stalk, from three to six feet high, upon the top of which appears a head of seed somewhat resembling a head of oats. Shortly before the harvest season the water is drawn off, so that horses may be used in harvesting the crop. The rice is then cut and the kernels threshed out, as in the case of wheat (Fig. 105). After the hull is removed, the grains are sent to NEW ORLEANS, GALVESTON, SAVANNAH, or CHARLESTON, to be polished, after which they are ready for market.

5. Tobacco

Unlike cotton, rice, and sugar cane, tobacco is not confined to our Southern States. Yet it is naturally a Southern plant, and is raised in the North in only a few places where conditions are especially favorable. Virginia and Kentucky, where tobacco is a very important product (p. 52), have a milder climate than the rest of the Middle Atlantic States. Tobacco is cultivated in all the Southern States, but most of all in Tennessee (Fig. 106) and North Carolina. CLARKSVILLE, Tenn., and DURHAM, N.C., are centers for trade in tobacco. Name some Virginia cities likewise engaged in the tobacco trade.

6. Fruits and vegetables

Fruits, such as strawberries, watermelons, apples, peaches, pears, grapes, and oranges, flourish in the

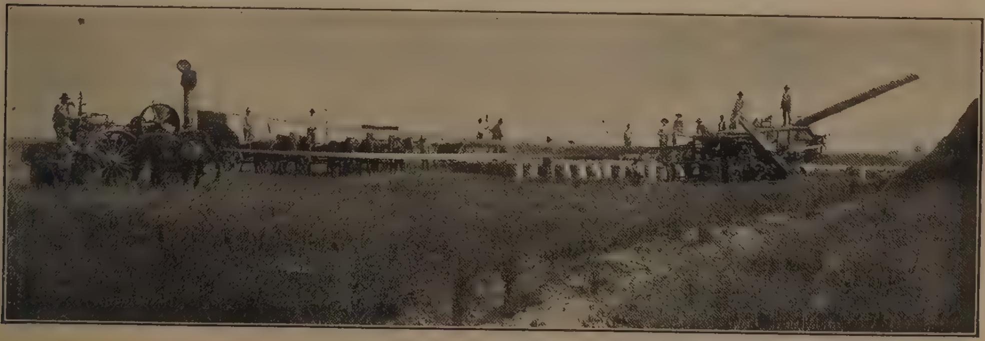


FIG. 105. — Threshing rice on a large rice plantation in Louisiana.

warm climate of the Southern States; so do vegetables, such as peas, beans, potatoes, sweet potatoes, and tomatoes. All these ripen earlier than in the North.

Florida is so far south that it has fruits of an entirely different kind. Besides oranges (Fig. 107), there are lemon and grape-fruit groves in many parts of the state. In southern Florida the climate is so warm that even tender tropical plants, such as cocoanuts and pineapples, thrive there. The pineapple plant, whose fruit is nestled in the midst of sharp-pointed leaves, grows especially well on the low coral keys and reefs that fringe the southern tip of Florida.

Fruits and vegetables from the South are sent in great quantities to the North, where they appear in the markets early in the spring. The oranges are sent throughout the winter. Thousands of bushels of fruit and vegetables are shipped at one time, by fast train or steamer, and at the proper season one may even see a whole train load of strawberries. Quantities of fruits and vegetables are canned in the South.

7. Other farm products

Many other crops besides those named are raised in the South, corn, wheat, and hay being among the most important. An immense quantity of corn is produced (Fig. 108), and over even a wider area than cotton itself; but since corn and wheat are raised even more extensively in other states, these grains are treated later (pp. 95 to 97).

Peanuts and sweet potatoes are two valuable products of these states. Stock of various kinds, such as horses, cattle, sheep, and hogs, is also raised, each plantation usually having some of these animals. Large numbers of cattle are also reared in the open pine forests of the Coastal Plains, especially in Florida and Georgia.

An important draft animal in the South, well suited to the warm climate, is the mule. On the fertile plains, especially in Tennessee, Missouri, and Kentucky, there are stock farms where particular attention is paid to raising mules and fine breeds of horses.

8. Ranching

In the western part of Texas, where there is little rainfall, grazing is the chief industry. The climate is so dry that the grass cures, and becomes hay, while still upon the ground, making excellent food for cattle (Fig. 109) and sheep. One may travel for miles over the plains of western Texas, seeing little else than a ranch house here and there, with an occasional herd of cattle or sheep, and cowboys riding to and fro.

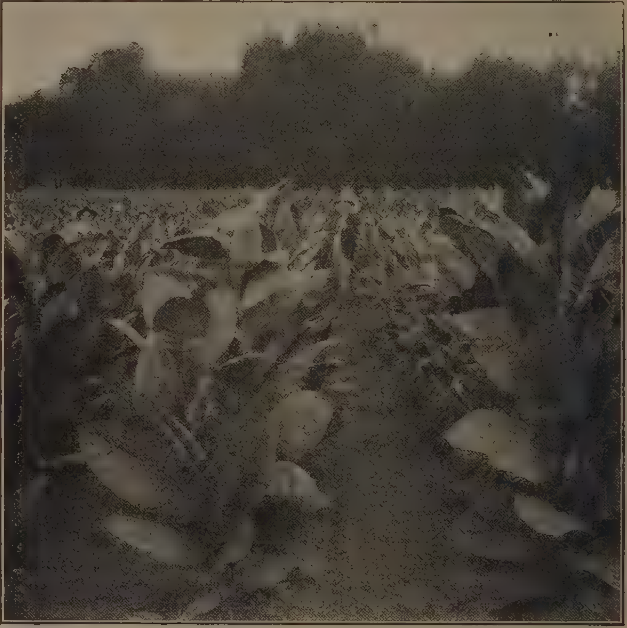


FIG. 106.—A field of tobacco in Tennessee.

While there is no reason for large cities here, and the life of the cowboys and sheep herders is a lonely one, it is their work that helps to supply our tables with meat, and to give us our woolen clothing and our shoes. Explain how hundreds of New England families depend for their daily meat upon the products of these distant lonely ranches. How dependent people are upon one another!

Mining

1. Coal and iron

There is a great variety of minerals in the South; but here, as in the North, the most important of all are coal and iron ore. One fourth of the coal of the country, and about one ninth of the iron ore, now come from the states south of Pennsylvania.

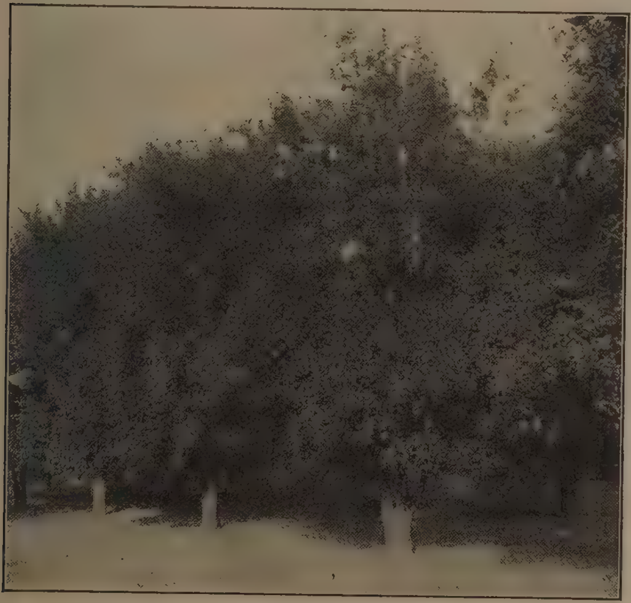


Fig. 107. — An orange grove near Jacksonville, Florida.

Coal and iron ore are found among the mountain ranges, and in the Appalachian Plateau, all the way from Pennsylvania to Alabama. They are mined in several places, as near CHATTANOOGA in eastern Tennessee; but most noted of all is the district around BIRMINGHAM, Ala., near the extreme southern end of the Appalachian system. This region is so rich in coal and iron that it now ranks as the second iron-producing section of the continent; and in coal production Alabama ranks sixth among the states of the Union. The Birmingham region is especially favorable because iron ore, coal, and limestone, the three materials necessary for the production of iron and steel (p. 57), are found there close together.

Coal is obtained not only in the Appalachian Mountains and Plateau, but in central Texas and Oklahoma. There are also iron ore and other minerals here. Beneath the plains bordering the Gulf of Mexico, from the Rio Grande to Georgia (Fig. 268), there is much brown coal, or lignite. This is not so good as the bituminous coal of the Appalachians, but it is valuable, and can be used for many purposes.

2. Oil and gas

There is not much natural gas produced in the Southern States, though it is found in several of them. The greatest quantity comes from Oklahoma. Petroleum, however, is of very great importance. Vast quantities have been found in Texas and Louisiana, near the Gulf of Mexico, and this is now one of the most noted oil regions in the world. Much is also found in Louisiana, and some in Tennessee.

3. Building stones and clays

There are valuable deposits of granite in several of the states, especially North and South Carolina, Georgia, Arkansas, and Texas. Excellent sandstone for building, and limestone for various uses, are also widely distributed. Among the important uses of the limestone here, as in the North, is the manufacture of Portland cement (p. 60).

There is much beautiful marble in Texas, Georgia, and Tennessee. The Georgia marble is widely known for its great beauty; and near KNOXVILLE, in eastern Tennessee, marble of different colors is quarried (Fig. 110). What city in Vermont is likewise noted for marble (p. 36)?

Clays of fine quality for bricks, tiles, etc., are found in many places; and there are also deposits of clay suited to the manufacture of high-grade pottery.

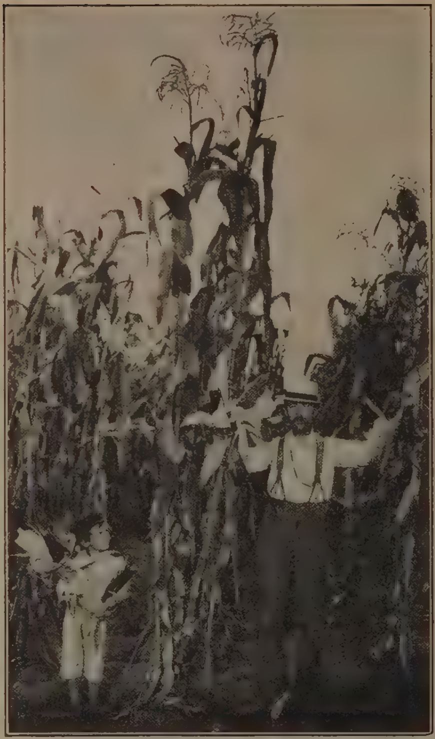


Fig. 108. — A field of corn in Arkansas. Notice how very tall the corn grows in this warm climate.

4. Phosphates

The soil of farms often becomes worn out and needs a fertilizer. There are various kinds of fertilizers, such as manure and bone dust, which furnish the plant food needed by crops; but one of the most important kinds is *mineral phosphate.* This is found in great quantities in Florida, Tennessee, and South Carolina; and from these states much of our phosphate is now obtained. Besides being used in the South, it is shipped from CHARLESTON, JACKSONVILLE, and TAMPA for use on farms in the North.

The phosphate is a deposit in which are found fossil remains of many animals, such as the teeth of sharks, and the bones and teeth of many large land animals, such as the huge mastodon, which once lived in this country.

5. Other mineral products

The South produces a variety of other minerals. Salt, for instance, is obtained in Texas and Louisiana. Bauxite, the mineral from which aluminum is made, is found in Georgia, Alabama, and Arkansas. Gold is mined in North and South Carolina, Georgia, and Alabama; silver in Texas and Tennessee; and copper in Tennessee. Some precious stones, such as the sapphire and the diamond, are also found. The South is, therefore, a rich mineral region, and the mining is rapidly growing in importance.

Before the Civil War there was little

Fig. 109. — Cattle on a ranch in western Texas.

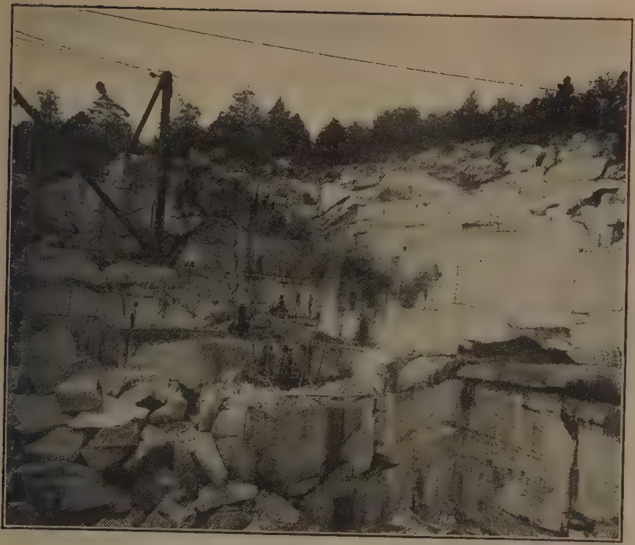


FIG. 110.—A marble quarry near Knoxville, Tennessee.

Manufacturing

1. Great advances in this industry

manufacturing in the South. The negroes, who did most of the hand labor, lacked the training necessary to handle machinery; and the raw materials were shipped away, while manufactured articles were brought back. Thus cotton went to England, New England, and elsewhere, some of it to be returned in the form of cloth; and lumber was shipped to various Northern cities, often to be sent back in the form of furniture. Very little iron ore or coal was mined in those days.

The situation is now greatly changed (Fig. 111). Indeed, the advance made in manufacturing, since the Civil War, has been wonderful. The raw materials are very abundant, and of many kinds, as we have seen. Name some of them. Most of these raw materials must be changed more or less for use, and this calls for manufacturing. There is a great abundance of coal, to furnish power for such work; and there is also much water power along the Fall Line, in the Piedmont Plateau, and among the mountains. The conditions here are very favorable, therefore, for manufacturing. Why, then, should these raw materials be sent far away to be manufactured?

This is a question that the Southern people have asked themselves; and they have answered it by the manufacture of many goods on a grand scale. There is every reason, too, to believe that this manufacturing will rapidly increase in the future, for the South has all that is necessary for very extensive manufacturing, and the people are awake to their opportunities.

2. Manufactures from the forest

Although much of the pine, oak, and other lumber is sent North, a great deal of it is made into doors, blinds, furniture, etc., at factories in MACON, MONTGOMERY, MOBILE, CHATTANOOGA, MEMPHIS, LITTLE ROCK, and ATLANTA (Fig. 112). HIGH POINT, in North Carolina, "the Grand

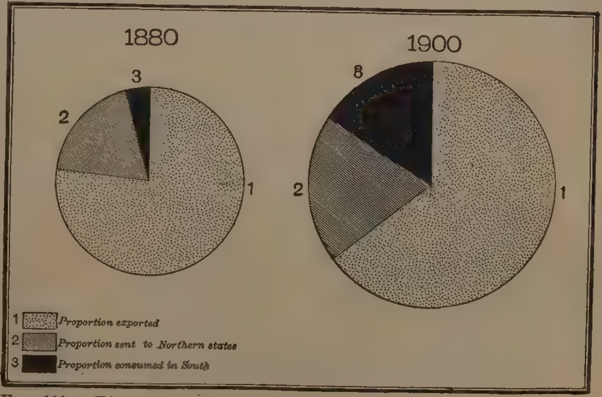


FIG. 111.—Diagram to show what was done with the Southern cotton in 1900, as compared with 1880.

Rapids of the South," is now one of the most noted furniture manufacturing centers of the South, although a few years ago it was hardly known. There are now eighty manufacturing plants there.

The Southern forests are of value in several other ways. From them are obtained *turpentine, wood alcohol*, and *tannic acid* (p. 42). The tannic acid from the hemlock bark of the North gives the leather a red color, so that shoes made from it need to be blackened; but tannic acid from the chestnut oak of the South gives a lighter, or tan, color, and it is from such leather that tan shoes are made.

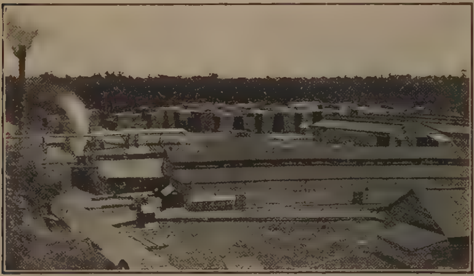


FIG. 112. — A planing mill in eastern North Carolina. Notice the great piles of boards in the yard behind the mill.

Turpentine is obtained from the sap of the long-leafed pine. The bark is cut through near the base of the tree, when the liquid oozes forth. This is then distilled in a furnace, and one of the products is turpentine. Other products obtained from the pine are rosin, tar, and wood alcohol. Thus the long-leafed pine is a very valuable tree, for all these products are used in every part of the country.

3. Manufacture of iron and steel goods

BIRMINGHAM, the leading iron manufacturing center of the South, and for that reason called the "Pittsburgh of the South," is located on an old cotton plantation. In 1880 the town had a population of 3086; but now it contains over 132,000 persons. What special advantages has it (p. 79)? In and near this city, as at Pittsburgh, the iron ore is reduced to iron in blast furnaces (p. 58) and then changed to steel and various other useful articles.

Several other cities near the mountains are noted for their iron manufacturing, as ROME and ATLANTA, in Georgia, and KNOXVILLE and CHATTANOOGA, in Tennessee. Chattanooga is also a center for the manufacture of farm machinery.

4. Cotton manufacturing

(1) Extent of cotton manufacturing, and leading centers

In some cities there are many cotton mills; for example, in CHARLOTTE, N.C., there are twenty-three, and in and near SPARTANBURG, S.C., thirty-eight. In other towns there are only one or two. From Danville, Va., to Atlanta, Ga., cotton mills are very numerous, and there are others throughout the cotton belt. Indeed, the Piedmont Plateau has become one of the greatest cotton manufacturing sections in the world. The map (Fig. 113) shows the distribution of these mills in a number of the Southern States.

While hundreds of Southern cities and towns now manufacture cotton cloth and cotton-seed oil, CHARLOTTE, N.C., COLUMBIA, GREENVILLE, and SPARTANBURG, S.C., and AUGUSTA, COLUMBUS, and ATLANTA, Ga., lead in these industries. What cities in New England are noted for cotton manufacture?

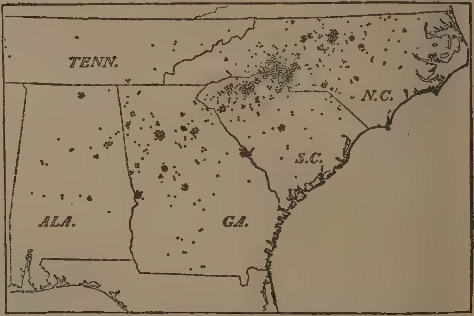


FIG. 113. — A map to show the extent of cotton manufacturing in the South. Each dot represents one mill.

(2) Meaning of a "mill"

The following facts from an Alabama cotton mill give some idea of the size and output of these mills. This particular mill employs 600 hands, including men, women, boys, and girls, and pays them about $2000 a week in wages. Every day this mill consumes 15 bales of cotton, each weighing about 500 pounds. Since the average yield per acre of land is about 250 pounds, you can easily figure out how many acres of cotton are called for in one year by this single mill.

In this mill, as in many others, white people are employed to do the work. While many of the mills are in the cities, others are in the country; and there villages have sprung up near the mills. Some of these new villages are already so large that they have their own schoolhouses and churches.

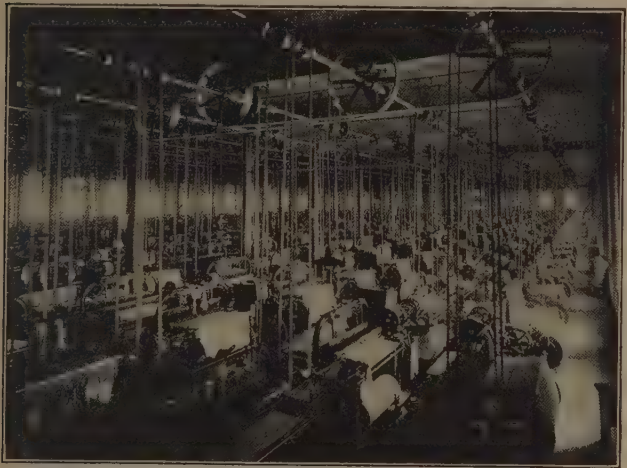


FIG. 114.—Interior of a cotton mill in the South. There are scores of machines, and each one works steadily weaving the cotton fiber into cloth.

(3) *Value of the cotton gin*

In the early days the cotton seeds were slowly picked out of the cotton by hand, and then thrown away. Whitney's invention of the cotton gin, in 1793, made it possible for one laborer to separate as much as a thousand pounds from the seed in the same time that five or six pounds could be cleaned by hand. That, of course, made cotton raising far more profitable, and led the planters to cultivate it more extensively.

(4) *Value of cotton seed*

The seeds have also been found to be of value, and are no longer thrown away. They are made into *cotton-seed oil*, which is used in making soap, imitation lard and butter, and a substitute for olive oil. There are from two to three pounds of seed to one pound of cotton, and since, on the average, one acre produces two hundred and fifty pounds of cotton, the value of the cotton seed from a large plantation is considerable. The part of the seed that is left, after the oil is pressed out, has been found to be an excellent food for cattle, and a good fertilizer. Thus the cotton plant now produces two valuable substances besides the cotton fiber.

5. Other manufactures in the South

Some of the other articles manufactured in the South have already been mentioned; for example, tobacco (p. 77) and sugar (p. 75). In each case the work is confined mainly to the section from which the raw material comes. Thus, NEW ORLEANS, near the sugar plantations, has large sugar refineries; and RALEIGH, DURHAM, WINSTON-SALEM, and other cities in northern North Carolina, manufacture tobacco.

KEY WEST, on a small coral key south of the Florida peninsula, is also noted for its tobacco factories. It is so near Cuba that the Havana tobacco, so much prized by cigar smokers, is easily obtained. There is also cigar manufacturing at TAMPA. Why there? Besides the articles mentioned, the South makes a great variety of other goods from the products of the farm, ranch, forest, and mine.

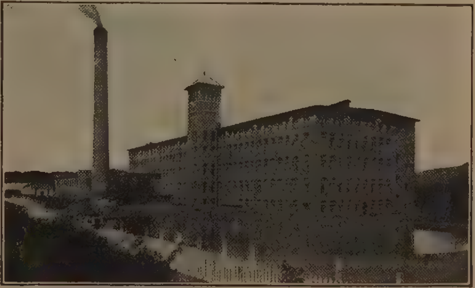


FIG. 115.—A cotton mill at Huntsville, Alabama. There are many others as large as this, and many, also, that are even larger.

Transportation of goods

With so many raw materials and so much manufacturing, commerce in the South is extensive. There are excellent opportunities for transportation of goods both by rail and by water. While some of the harbors are shallow and partly closed by sand bars, others are deep enough for large ocean ships. The principal seaports are kept open by building jetties, and by dredging the sand away. Here, as in the North, the government spends large sums of money each year for this purpose.

The Mississippi River is a great artery of trade (Fig. 117), with many navigable branches; and on the Coastal Plains there are numerous short streams navigable for small boats. Railroads, also, are well developed, connecting all important points in the South with one another, and with other parts of the country. Among these are some of the leading railways of the country, such as the Southern, the Southern Pacific, and the Louisville and Nashville railways.

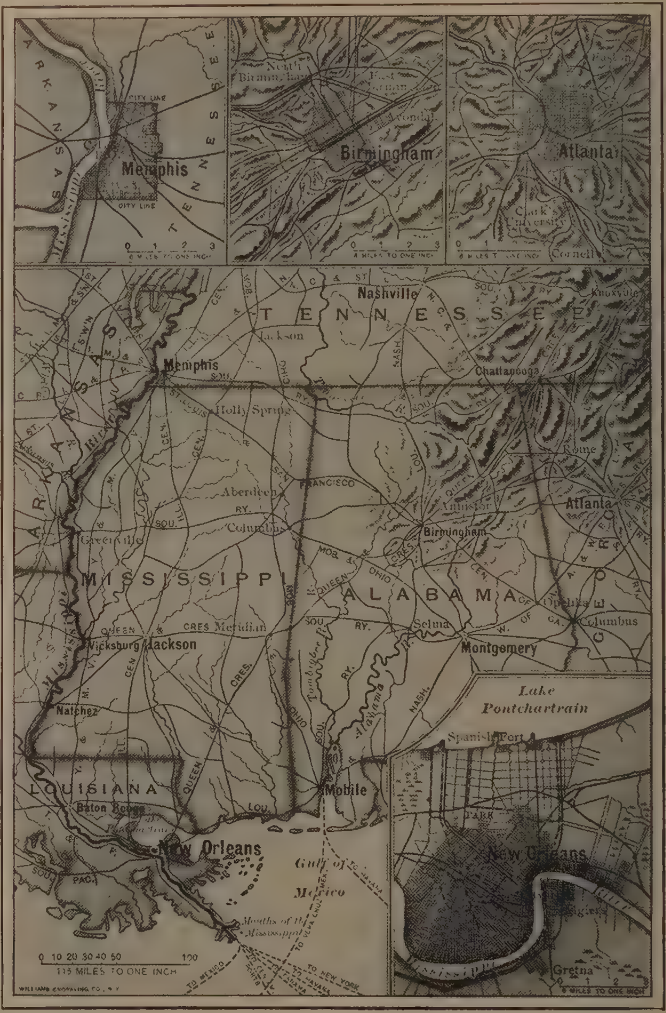


FIG. 116.—Map to show location of New Orleans, Memphis, Birmingham, and Atlanta.

Leading centers of commerce

1. New Orleans

(1) ***Its size and location***

The greatest of all the Southern cities is NEW ORLEANS, the largest in the eastern part of the United States south of St. Louis, with a population of over three hundred thousand. New Orleans is situated at the gateway to the most productive valley in North America, about one hundred miles above the mouth of the Mississippi. On the map (Fig. 116) you will see that an arm of the sea, called Lake Pontchartrain, reaches up to the city, and that New Orleans is located at the place where the river and lake are nearest together. At this point the Mississippi makes a great bend, in the form of a half-circle, which explains the name, *Crescent City*, commonly given to New Orleans.

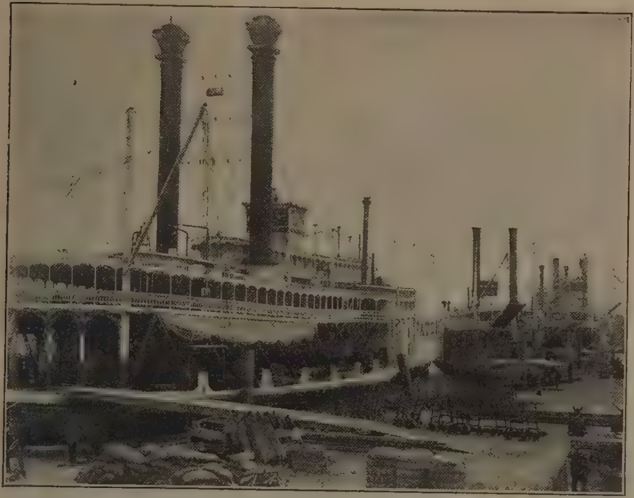


Fig. 117.—River steamers at New Orleans. These boats carry large amounts of freight, as well as passengers, up and down the river.

That particular spot was selected for the site of the city, because the sailing ships of two centuries ago could reach it by crossing the lake, while they could not sail a hundred miles up the river without great difficulty. On account of the shallow water, the large ocean steamers now in use cannot enter the lake, but they can reach the city by the river route.

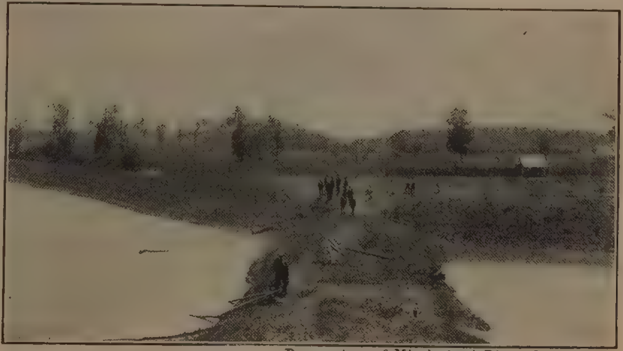
(2) Its interior connections by water and rail

When we recall the advantages of New York's water connection with the West, we can readily understand the growth of New Orleans. Pittsburgh on the Ohio, St. Paul on the Mississippi, and Kansas City on the Missouri, can all be reached from New Orleans by boat (Fig. 40). How do these distances compare with those from New York to Chicago and to Duluth? Also, how far apart are Pittsburgh and Kansas City? Much of the country between these cities is within easy reach of the Mississippi or some of its branches.

There is now a plan to improve the Mississippi River so that large boats can navigate it more easily. When this is done, the port of New Orleans will be even more important as a shipping point for the fertile Mississippi Valley.

Like New York, New Orleans is connected with the interior of the country by rail as well as by water. The Illinois Central Railway extends all the way to Chicago, running parallel to the river for much of the distance; the Louisville and Nashville reaches Louisville, St. Louis, and other cities; and the Southern Railway runs from Washington to Atlanta, with connections to New Orleans, and thence the Southern Pacific Railway extends westward, across Texas, to California.

Much of the land on which New Orleans is built is frequently below the level of the river. In fact, from Memphis southward, a large part of the land on either side of the Mississippi is a low flood plain,



By courtesy of Mississippi River Commission.

Fig. 118.—The embankment, or levee, along the Mississippi, built to prevent the river from overflowing the flood plain.

(3) *Difficulties caused by the river*

spreading out for many miles, and often threatened with floods. The mighty river, receiving tributaries from regions thousands of miles apart, is charged with yellow mud, which gradually sinks to the bottom as the current becomes slower toward the mouth. This has built up the bed of the river, so that at high water the floods would spread out over the low land if they were not shut in by strong walls of earth, called *levees* (Fig. 118).

In spite of their strength, these embankments sometimes give way, especially in the springtime, when the snows are melting in the North; then the destruction to life and property is appalling. At such times hundreds of men patrol the levees, night and day, to check the slightest leak. A hole made by even a crawfish may be the beginning of a destructive flood.

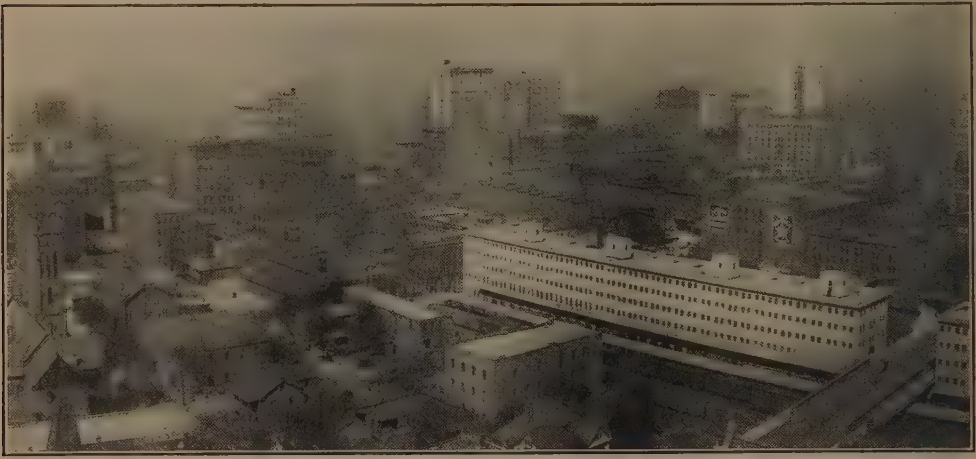


FIG. 119. — A view of Atlanta.

Because the land near the river is so low, the soil on which New Orleans stands is very damp. Indeed, in digging foundations for buildings, water is reached a short distance below the surface. On that account it has been difficult to provide proper drainage. A system of drainage and sewerage has, however, been established at great expense.

(4) *People, and climate of the city*

New Orleans once belonged to France (p. 25), and one person in six in the city is of French stock. French is still spoken by some of these.

Frost seldom reaches this city, and the midwinter weather is rarely colder than the early autumn of the North. What must be the effect of this climate upon the style of houses? Also upon the presence of birds, flowers, and fruits in winter?

2. Memphis and Atlanta

MEMPHIS and ATLANTA (Fig. 116) are two other large and rapidly growing southern cities. The former is situated in Tennessee, on a bluff with the Mississippi River at its base. Why is that a favorable location for the growth of a large city? Memphis is a noted river port, and one of the great cotton centers and lumber markets of the South.

ATLANTA (Fig. 119), the "Gate City," is one of the few large cities not located upon a water route. Northeast of it, for over three hundred and fifty miles, there is no easy pass across the mountains, and until 1880, in all that distance no railway crossed the Appalachian Mountains. Near Atlanta, however, there is a good route; and railways reaching westward from the Carolinas, or northern Georgia, come together here, making Atlanta a great railway center.

Owing to its favorable situation as a railway shipping point, Atlanta is the leading interior wholesale market of the South; and it surpasses all Southern cities in the number and variety of its manufactures. Among its factories are lumber, cotton, and iron mills. It is one of the most progressive cities in the country, and, like other Southern cities, is a busy center.

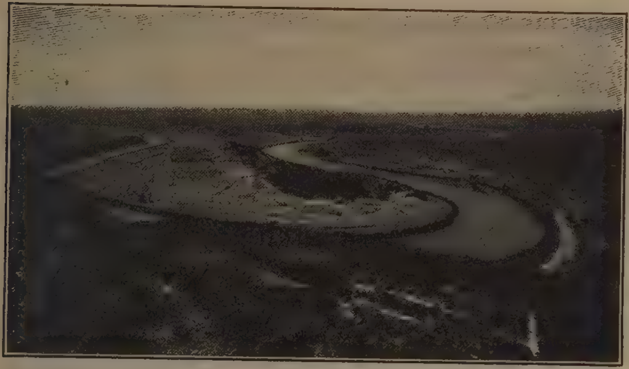


FIG. 120. — Moccasin Bend in the Tennessee River, as seen from Lookout Mountain. Chattanooga is situated on the river bank just to the right of the middle of the picture.

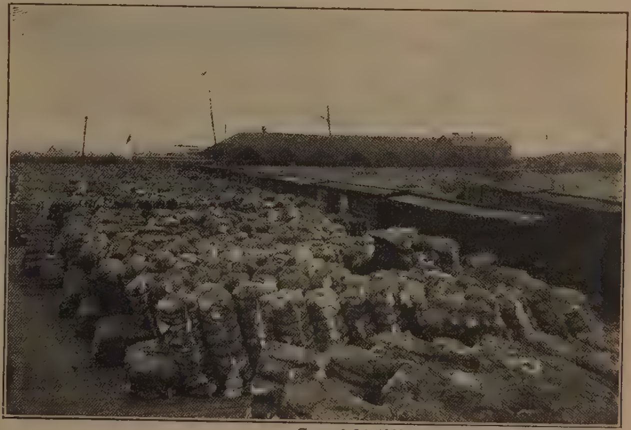
3. Nashville, Knoxville, and Chattanooga

If we recall the roughness of the plateau west of the Appalachians, we can understand the reason for the location of CHATTANOOGA. It is on the Tennessee River (Fig. 120), at a point which makes it a gateway somewhat like Atlanta. There is much manufacturing here, especially of articles made of iron and wood. Another busy manufacturing city, near by, is KNOXVILLE, which is not quite so large as Chattanooga.

NASHVILLE, the capital of Tennessee, has sawmills, furniture factories, and flour mills. There are more than six hundred factories in this city. Being in the midst of a splendid farming country, it is a distributing point for supplies to the surrounding towns and farms. It is also one of the educational centers of the South, having Vanderbilt University and other important schools. There are several other well-known universities in the South, and each state supports a state university. Many of these take a high rank among the universities of the country.

4. Seaports east of the Mississippi

The coast cities are chiefly engaged in shipping cotton and lumber, and most of them are located near the mouths of rivers, so that these goods may be brought to them by water as well as by rail. In them, also, there is important manufacturing, especially of cotton goods and lumber. Two of the best-known seaports are CHARLESTON and SAVANNAH, both long noted as shipping points for cotton (Fig. 121), lumber, and other goods. Charleston is the leading lumber port in the South. MOBILE, on



Copyright, 1900, by Detroit Photographic Co.

FIG. 121. — Thousands of bales of cotton on one of the wharves at Savannah, ready for shipment.

Mobile Bay, is another important Southern port.

In Florida are TAMPA and PENSACOLA, both with excellent harbors, and both rapidly growing. Besides its cigar manufacturing (p. 83), Tampa has a growing trade with the West Indies. It is the terminus of important railways, and is the nearest port in the country to the Panama Canal. Owing to the canal the trade of both Pensacola and Tampa has already greatly increased.

5. Other cities of the Mississippi Valley

Since so much cotton is shipped away, there has been need of a large number of shipping points. Therefore, besides the cities already named, most of which are extensively engaged in cotton shipping, we find the cotton ports of VICKSBURG, NATCHEZ, and BATON ROUGE, on the Mississippi, and SHREVEPORT and LITTLE ROCK on tributaries to that river.

6. Cities in Texas

(1) *Size of this state*

Texas is the largest state in the Union. It is even larger than all the thirteen states included in New England and the Middle Atlantic States, and has a greater area than either France or Germany. At one time it was a separate country, having won its independence from Mexico in 1836. But it desired later to enter our Union, and was admitted as a state in 1845.

(2) *Smallness of the population in the west*

Throughout the arid western section there are no cities and few large towns, except in the extreme western corner on the Rio Grande, where EL PASO is located. The Spanish word "El Paso" means "the pass," for this city is situated at a pass in the Rocky Mountains, through which the Southern Pacific Railway extends westward, while an important line reaches southward into Mexico. Much of the land along the Rio Grande and Pecos rivers, and some other streams, is irrigated; but in most of the western part of Texas the chief industry is cattle raising, in which Texas is the leading state of the Union.

(3) *Resources in the east, and the cities there*

East of the arid and semiarid plateau, most of the crops of the Southern States grow in great abundance. Rice and sugar cane flourish on the Coastal Plain, and forests are extensive. On the higher plains, just west of these lowlands, the warm climate and fertile soil are especially favorable to cotton. Texas leads all the states in the production of this valuable crop. What important minerals are found in Texas, and in what parts of the state (pp. 79, 80)?

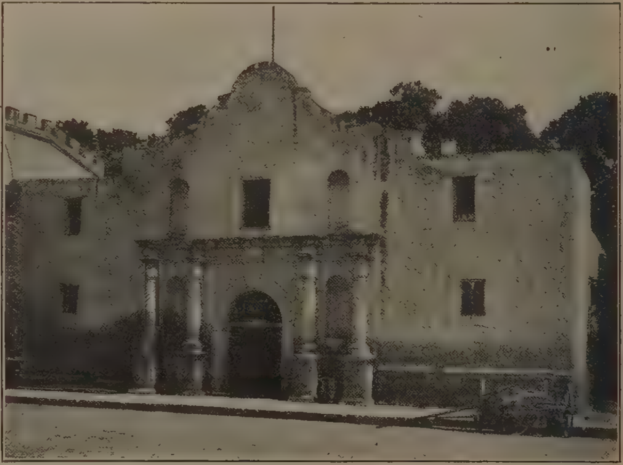


FIG. 122. — The Alamo, at San Antonio — an old Spanish church, famous in the history of Texas.

Naturally, since so many raw materials are produced in the eastern half of this state, large cities are located there. Two of them are DALLAS and FORT WORTH — both shipping points, the former for cotton, the latter for cattle from the plains of the West. Dallas is also a busy manufacturing center. AUSTIN, the capital, is on the Colorado River, and SAN ANTONIO (Fig. 122), the largest city in the state, lies farther southwest.

Two other important cities are HOUSTON, near the coast, and GALVESTON, the principal seaport west of New Orleans. Immense quantities of cotton and other products are shipped from Galveston. It is also a port of outlet for goods from the Far West. Railroads from the north and west cross Texas to Galveston and other Gulf ports; and railway lines likewise cross the state to Mexico and California.

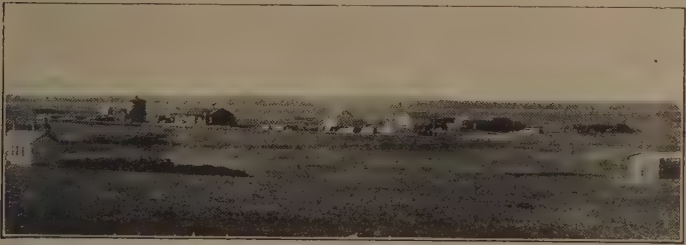


FIG. 123. — A view of Oklahoma City as it appeared April 22, 1889. Compare this with Figure 124.

No one of the cities of Texas is yet of great size, since manufacturing is not extensively developed. But here, as in the other Southern States, there is much recent advance in manufacturing.

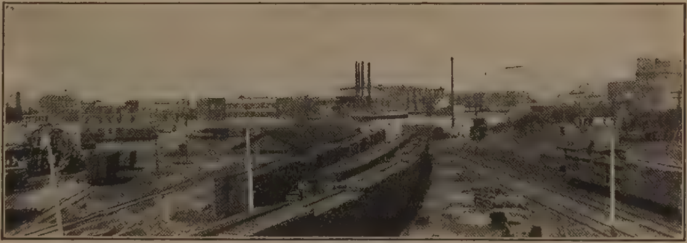


FIG. 124. — A view of a part of Oklahoma City in 1908. Compare this with Figure 123 to see the great change in less than twenty years.

7. Oklahoma

(1) *Its history*

All of our states, except the thirteen original states, were once territories, occupied by Indians. As they became settled they were, one by one, admitted to the Union as states. One of the last states to be admitted was Oklahoma, and it is therefore of special interest. Not many years ago Oklahoma was occupied by Indians alone. As the red men in various parts of our country were conquered, and the land that they occupied became needed by white men, the Indians were placed on lands reserved for them in different places. These reserved sections were called *Indian reservations*, and at one time nearly all the area at present included in the state of Oklahoma was given over to the Indians. It was then called *Indian Territory*.

As our country became more and more settled, and it was found that the Indian Territory had great resources, the white men desired this land also. One strong reason for taking it from the Indians was that they did so little to develop it. Accordingly, in 1890, the western part of the Indian Territory was thrown open to white settlers, and called Oklahoma. People rushed in there, by thousands, to secure the free farms that the government offered, and the region was rapidly settled (Figs. 123 and 124). Then people asked that the two divisions, the Territory of Oklahoma in the west and Indian Territory in the east, be admitted into our Union as one state. This was granted, and in 1907 the new state was admitted under the name of Oklahoma.

(2) *Its resources*

Oklahoma, like Texas, is largely a plain; but in the east there are low, forest-covered mountains, containing coal, iron, and other valuable minerals. In the extreme west the climate is more arid, and grazing is the leading industry; but in most of the state the plains are splendidly fitted for agriculture. Many farm crops are produced, the leading ones being corn and other grains in the north, and cotton in the south.

(3) *Chief cities*

Although the state is so new, there has already been great development of agriculture, lumbering, and mining, and no doubt there will be much greater advance in the next few years. The progress in manufacturing is indicated by the number and size of cities and towns that have already sprung up. The largest is the capital, OKLAHOMA CITY, but MUSKOGEE, SHAWNEE, and GUTHRIE are also large and growing cities.

Review Questions

1. How are the surface features of the northeastern portion of these states similar to those farther north? 2. To what extent is the surface of the Southern States level? 3. What mountains are found there, besides the Appalachians? 4. What is the character of the coast? 5. Describe the climate. 6. What is the rank of the South in the lumbering industry? 7. Name the kinds of trees found there, and tell how the lumbering is carried on. 8. What about fishing? 9. To what extent is agriculture important? 10. Why was slave labor needed on the cotton plantations? 11. Tell about the amount of cotton produced, and the climate it requires. 12. How is the cotton raised and marketed? 13. What plants produce sugar? 14. Where is sugar cane grown, and how is it cultivated? 15. How is sugar obtained from the cane? 16. What about the importance of rice as a food? Why may we expect that more will be raised in the future? 17. How is it cultivated and prepared for market? 18. Where is tobacco produced in the South? 19. What can you tell about fruit and vegetable raising here? 20. What other farm products are raised? 21. Where is ranching important? Why? 22. Where are coal and iron ore found? 23. Oil and gas? 24. What about building stones and clays in the South? 25. Phosphates? 26. What other mineral products are important? 27. How has manufacturing in the South advanced since the Civil War? 28. What goods are manufactured from products of the forests? 29. Name the principal cities engaged in that work. 30. What cities lead in the manufacture of iron and steel goods? 31. What is the extent of cotton manufacturing? 32. Name the chief cotton manufacturing cities. 33. Explain the value of the cotton gin. 34. Of what value are the cotton seeds? 35. What other manufacturing is carried on in the South? 36. What conveniences has the South for the transportation of goods? 37. Tell about the size and location of New Orleans. 38. What connections by water and rail has it with the interior of our continent? 39. What difficulties are caused by the Mississippi River? 40. Tell about the people in New Orleans. What about the climate there? 41. State the important facts about Memphis and Atlanta. 42. About Nashville, Knoxville, and Chattanooga. 43. Locate and give the principal facts about the coast cities east of the Mississippi; other cities of the Mississippi Valley. 44. What about the size of Texas? 45. Why is the population so small in the western part? 46. What are the resources in its eastern part, and the chief cities there? 47. Give a brief history of Oklahoma. 48. What are its resources? 49. Name and locate its chief cities.

Review Questions by States

North Carolina (N.C.). 1. Which part is mountainous? Name and locate the highest peak east of the Mississippi River. 2. What are the surface features of this state? 3. Which cities are mentioned in this text? Where is each? For what is each important? 4. What capes do you find on the coast? 5. What are the leading industries? (See Figs. 249 to 278.) 6. Draw an outline map of this state, like that of Maine. Do the same later for each of the other states.

Tennessee (Tenn.). 7. Where are the mountains? The plains? 8. Name two cities among the mountains. For what is each important? 9. State facts about two other cities in Tennessee. 10. Which city is the largest? (See table, Appendix, p. 427.) 11. What large rivers drain the state? 12. What are the leading industries in this state?

South Carolina (S.C.). 13. Describe the surface features of the state. 14. What are the principal industries? 15. What city is on the Fall Line? On the seacoast? For what is each important? 16. Which city is largest?

Georgia (Ga.). 17. Where are the mountains? 18. The plains? 19. What are the industries? 20. Trace the Fall Line across the state (Fig. 66). What cities are on it? 21. Why is Atlanta situated where it is? 22. How does it compare in size with the largest city in each of the three states just mentioned? 23. How does it compare in size with New Orleans, Buffalo, and Providence? 24. Name the two seaports. What do they ship?

Florida (Fla.). 25. What about the relief of this state? 26. Explain the irregular southern coast and the Florida Keys. 27. Describe the climate. How does this influence the crops?

28. What Florida cities are mentioned, and how is each important? Locate each. 29. What mineral product comes from Florida?

Alabama (Ala.). 30. Trace the Fall Line across this state. What cities are situated on it? 31. Where is Mobile? How is it important? 32. Describe the location and industries of Birmingham. 33. What crops are raised in Alabama? 34. What cities are engaged in manufacturing cotton? 35. In lumber manufacturing? 36. Compare Mobile in size with Atlanta and Birmingham.

Mississippi (Miss.). 37. Why is there no city on the coast? 38. In what way can the products of the state be shipped by water? 39. From what cities? 40. What are the products? 41. Why no mining? 42. What about the extent of cotton raising in this state (Figs. 253, 254)?

Louisiana (La.). 43. State the reasons for the great importance of New Orleans. 44. Why has it a better location than Mobile or Charleston? 45. Compare it in size with those cities. 46. With Boston and Baltimore. 47. What large tributary enters the Mississippi in Louisiana? 48. What crops are raised in Louisiana? Why there? 49. Tell how the delta is caused to grow (p. 6).

Arkansas (Ark.). 50. What large river enters the Mississippi in this state? 51. There is much forest in Arkansas; what kinds (Fig. 265)? 52. Is Arkansas in the cotton belt? (See Fig. 253.) 53. The capital is the largest city. Compare it in size with Memphis. Why is it less favorably situated than that city?

Texas (Tex.). 54. Where are the mountains? 55. Where are the forests? Why there? 56. What are the industries on the western plains? 57. What city lies in the western part? Why there? 58. What are the industries in eastern Texas? 59. What cities are in eastern Texas? 60. For what is Galveston noted? 61. Compare it in size with New Orleans and Charleston. 62. Texas is how many times as large as Rhode Island? (For area, see table in Appendix, p. 425.) As Pennsylvania? 63. Add together the areas of all the New England and Middle Atlantic States, and compare the total with the area of Texas. 64. Compare the population of Texas with that of Massachusetts. (See Appendix, p. 425.)

Oklahoma (Okla.). 65. What has been the history of this state? 66. What about the climate of the western part? 67. What crops are raised in the northern part? In the southern part? 68. Into what river does the state drain? 69. Name and locate the chief cities.

General Review Questions

70. Which is the smallest of the Southern States? 71. Compare it with Pennsylvania and Massachusetts in size. 72. State the principal industries of the South. 73. Of what advantage is it that they are so different from those of the North? 74. Name the principal cities on the Fall Line, and explain the importance of each.

Suggestions

1. Show several ways in which New England and the Southern States are dependent on each other. 2. What effect did our Civil War have on the cotton manufacturing of England? 3. Near what places were some of the great battles of the war fought? 4. What other inventions may well be compared with the cotton gin in importance? 5. About how much sugar does your family use each year? 6. What reasons can you give for expecting the cotton mills in New England to prove less profitable, now that the South is developing such mills? 7. Find out how much nearer it is from Chicago to the Panama Canal by way of New Orleans than by way of New York. What effect will this probably have on New Orleans? 8. Through what waters would a boat go from New Orleans to Kansas City? To Pittsburgh? To Chicago? To San Francisco? 9. Make a drawing of these states, including the principal rivers and cities. Locate the capitals.

5. Central States

Map Study

1. Name the large rivers of this group. 2. Draw a sketch map showing them. 3. Into what ocean does the Red River of the North flow? 4. Sketch the five Great Lakes. 5. Locate upon each of these sketches the cities printed in large type. 6. Are any of the very large cities in these states not situated on rivers or lakes? 7. How far did the glacier advance in these states (Fig. 18)? 8. In what ways must the Great Lakes have influenced the development of this region? 9. Where are mountains found in these states? 10. What does the fact that there are so many rivers tell about the rainfall?

Surface features

1. Extent of level land

A little over a hundred years ago, when the pioneers had pushed across the Appalachian Mountains into Ohio and Kentucky, they were gladdened by the sight of immense tracts of level land (Fig. 127). For hundreds of miles the plains slope gently toward the Mississippi; and beyond that river, they slowly rise again, for hundreds of miles, to the very base of the Rocky Mountains.

In western South Dakota and in southern Missouri, low mountains rise above the plains. There is a hilly region around the western end of Lake Superior, in Michigan, Wisconsin, and Minnesota; and in eastern Ohio and Kentucky there is also hilly land, for the Appalachian Plateau extends into these states. With the exception of these small areas of mountains and hilly lands, most of the region is a vast level tract, quite unlike the hilly and mountainous country farther east. What are the names of the mountains of the Central States?

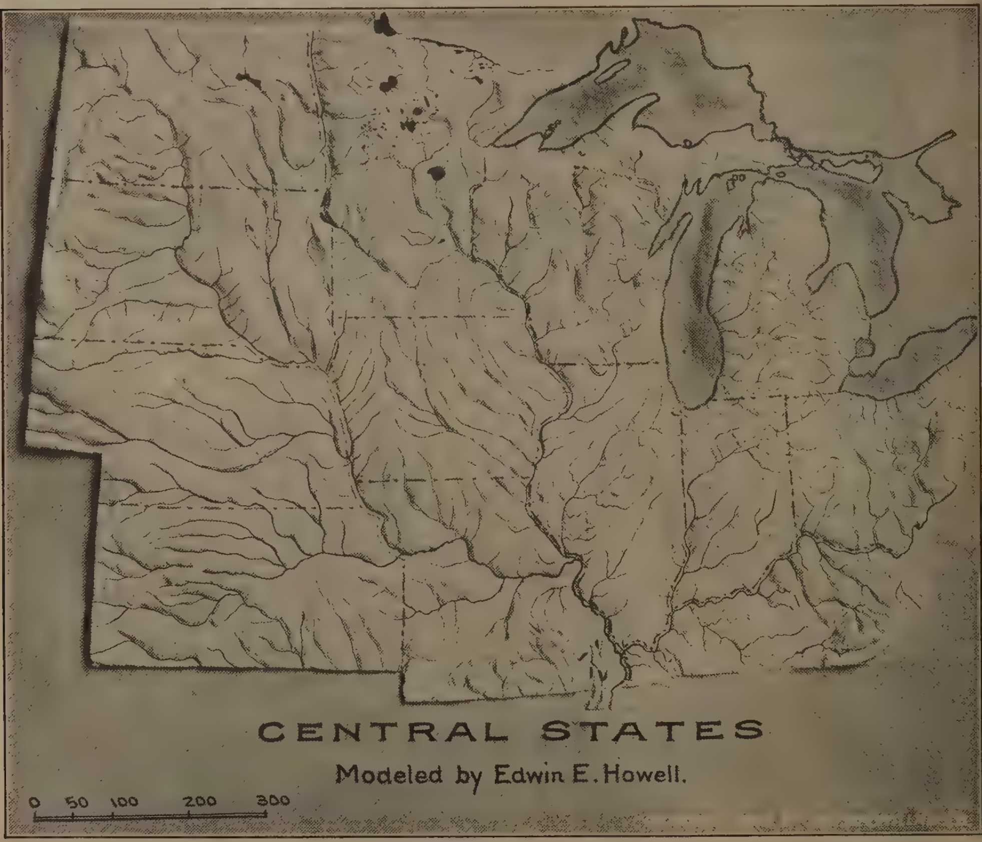


Fig. 126. — Relief map of the Central States.

2. Absence of trees and bowlders

The hearts of the pioneers were gladdened not only because the land was level, but because a large part of it was free from forests and bowlders. In many sections of New England weeks of hard labor were required to remove the trees from a single acre, and to drag away or bury the bowlders. On the prairies (p. 19) of the Central States, however, such labor was unnecessary, for there were hundreds of thousands of square miles covered with grass (Fig. 127).

Climate

1. The temperature, with reasons for the extremes

Being so far from the coast, this region is not influenced by sea breezes, as are some of our states. Florida, for example, being nearly surrounded by water, receives breezes from the ocean that greatly temper the heat of summer. Similar breezes greatly temper the cold in winter, for the ocean does not

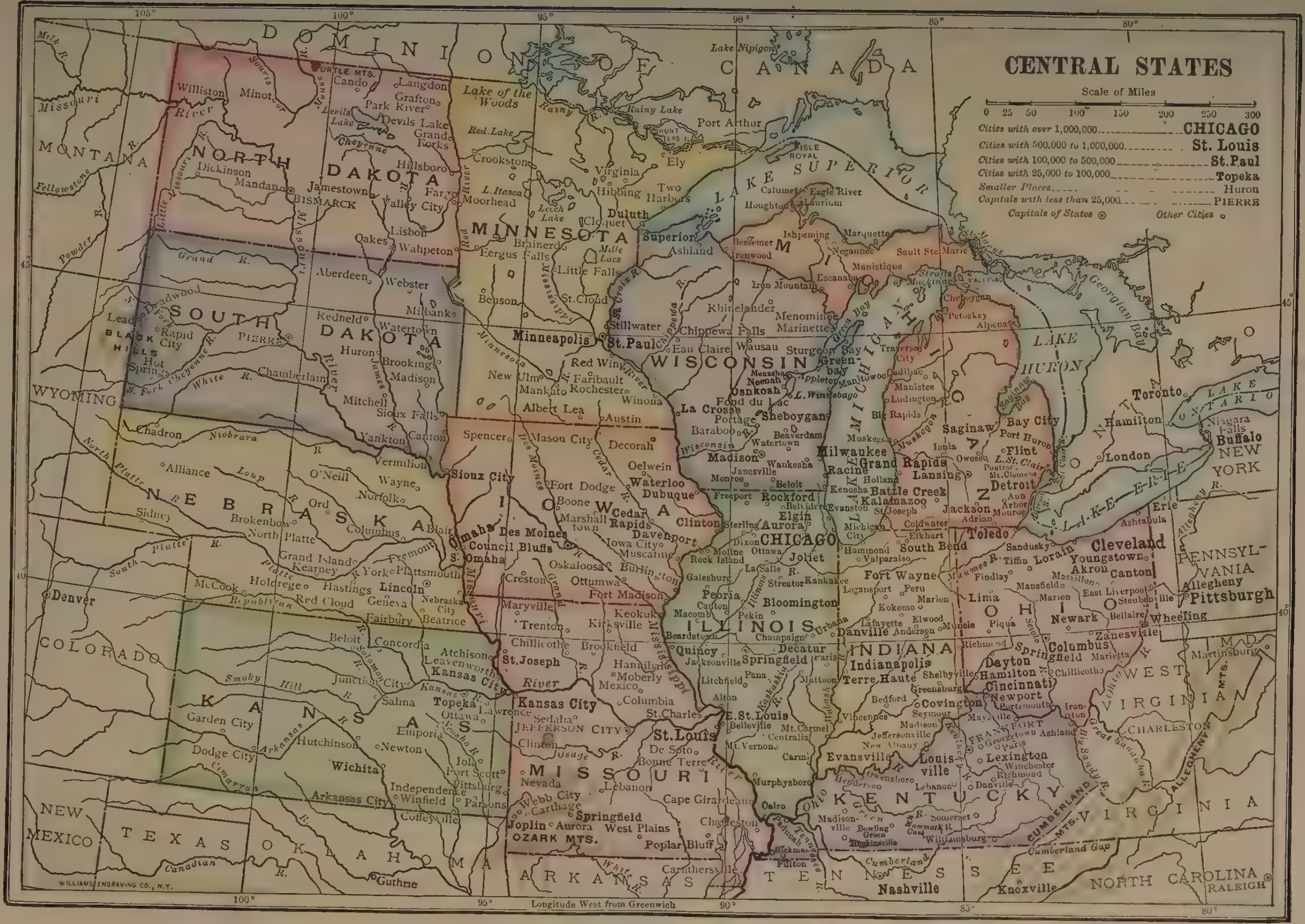

CENTRAL STATES
Scale of Miles
0 25 50 100 150 200 250 300
Cities with over 1,000,000 CHICAGO
Cities with 500,000 to 1,000,000 St. Louis
Cities with 100,000 to 500,000 St. Paul
Cities with 25,000 to 100,000 Topeka
Smaller Places Huron
Capitals with less than 25,000 PIERRE
Capitals of States ◎
Other Cities ○
DOMINION OF CANADA
NORTH DAKOTA
SOUTH DAKOTA
MINNESOTA
WISCONSIN
MICHIGAN
IOWA
NEBRASKA
KANSAS
MISSOURI
ILLINOIS
INDIANA
OHIO
KENTUCKY
WEST VIRGINIA
VIRGINIA
TENNESSEE
NORTH CAROLINA
PENNSYLVANIA
NEW YORK
MONTANA
WYOMING
COLORADO
NEW MEXICO
TEXAS
OKLAHOMA
ARKANSAS
LAKE SUPERIOR
LAKE MICHIGAN
LAKE HURON
LAKE ERIE
LAKE ONTARIO
Georgian Bay
Longitude West from Greenwich
WILLIAMS ENGRAVING CO., N.Y.

FIG. 125.

become so cold as the land. Thus water makes the temperatures of the two seasons more nearly equal, or *equalizes* it. For that reason such a climate is said to be *equable.*

Because the Central States are so far from the ocean, the summers are very warm, while the winters are very cold. It is often as hot there in summer as it is in the Southern States; but in winter the coldest part of our country is in North Dakota and Minnesota. Such a climate, with hot summers and cold winters, is common in the interior of continents and is, therefore, called a *continental* climate. It is also said to be *extreme*, in distinction from a climate that is equable.

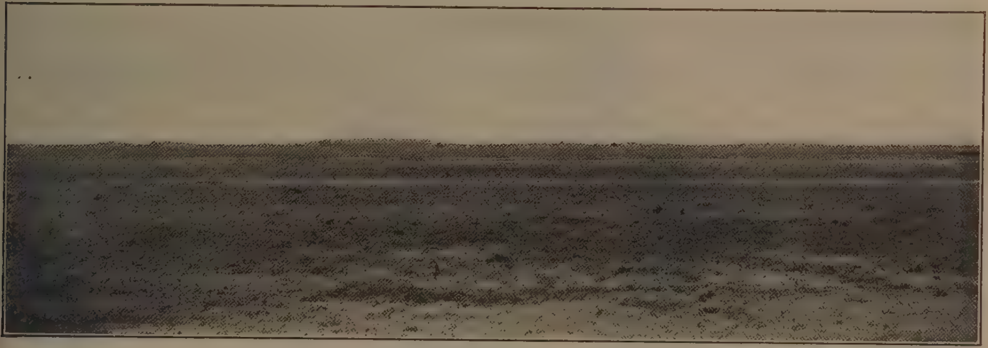


FIG. 127. — A view on the level plains of the Mississippi Valley. For hundreds of miles there is just such level land as this.

The Great Lakes are such large bodies of water that they influence the climate near them much as the ocean does, only to a less degree. Thus the climate is cooler in summer, and warmer in winter, along the shores of the lakes, than at a distance from them.

2. The fall of rain, with reason

Since these states are so far from the ocean one might suppose that they would receive little rain. This is true of the western part of Kansas, Nebraska, and the two Dakotas, where the climate is arid. The reason for this arid climate has already been stated (p. 7). With the exception of the western border, however, the Central States have ample rain for farming, as is indicated by their many rivers. This rain is brought from the Gulf of Mexico and the Atlantic Ocean, by the winds which every few days blow from the south and east.

Agriculture east of the arid lands

1. Its importance

From eastern Ohio to western Nebraska, and from the Great Lakes to the Gulf of Mexico, agriculture is a very important industry. Indeed, millions of persons in Europe and in our coast cities look to the Mississippi Valley for their bread, meat, and other food, as they look to the South for cotton.

2. A farm in central Ohio

(1) The house and its surroundings

The farms vary greatly in size, from a few acres to several thousand, but the majority contain from 80 to 160 acres. In the main, they resemble the one in Ohio that is here described. On this Ohio farm of 160 acres, is a house in which the family lives, with a barn near by for horses, milch cows, and hay, and with sheds near it for storing grain and farming implements.

A windmill at the rear of the house keeps the milk house well supplied with cold water, and also fills the water troughs in the barnyard. Near the house is an orchard (Fig. 129) of apple, peach, and pear trees, with a few rows of berry bushes in one part, and a chicken house in another (Fig.

128). Here enough chickens are raised to supply some meat, and all the eggs that are needed, with some to sell. On one side of the front yard are a few beehives, and back of them, between the orchard and the barn, is a garden of vegetables. Still back of that are several pigpens, in which hogs are fattened for home use, and also for the market.

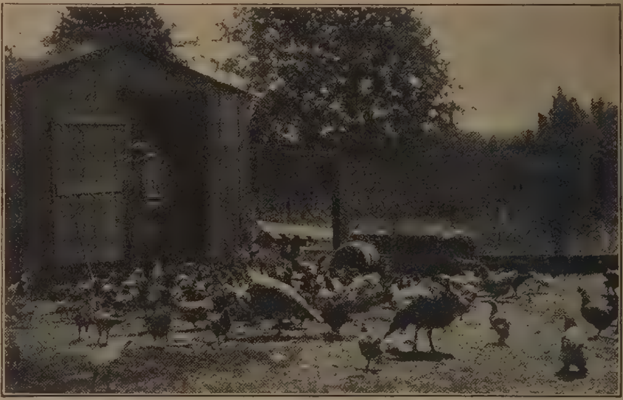


FIG. 128. — A farmer feeding his chickens and turkeys.

(2) The fields, and what is done with their crops

Farther away from the house are fields in which there are at least three or four different kinds of crops. Every farmer in that vicinity expects to raise corn, — perhaps sixty acres of it, — some grass for grazing and for hay, and wheat or some other kind of grain.

After these crops are harvested, they are either sold or fed to stock — horses, cattle, hogs, or sheep — upon the farm. The latter plan is often followed, chiefly because it pays better to fatten stock and sell it, than to sell the crops themselves. There are generally two or three good milch cows on the farm, which not only supply the family with fresh milk and butter, but furnish some cream or butter to sell.

FIG. 129. — A farmer and his family in the orchard near the house.

(3) Contact with neighbors

Since there are usually only a few houses in sight of a farmhouse, and no store or post office within a number of miles, the farmer and his family may not meet with other persons for several days at a time, although they often see friends driving by. In the busiest season, from spring till fall, they make few trips to town. However, they have a telephone by which they can talk with neighbors, and with friends and merchants in town, while the postman brings the mail to their doors.

(4) Attractions of such a life

Some persons would not care for such a life as this, because it is too lonesome, and there is too much hard work connected with it. But this farmer enjoys it greatly, because he likes to take care of his stock, to work in the soil, and to watch his crops grow. In addition, he is able to raise most of his own food, and his whole

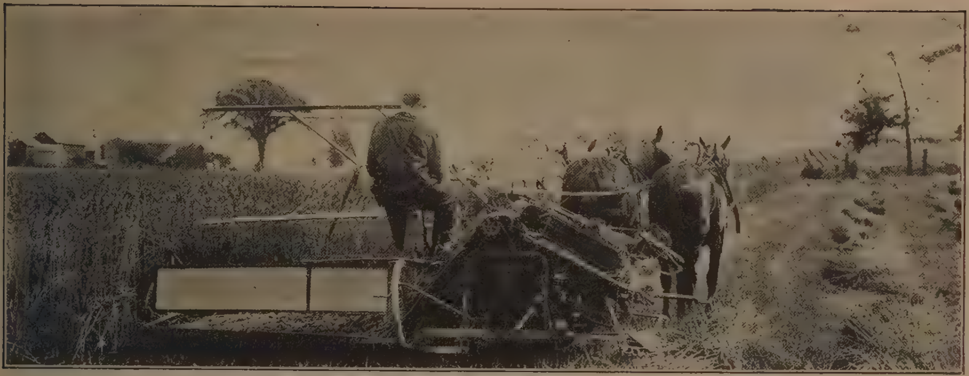


Fig. 130. — A farmer cutting and binding wheat in the harvest season

life is more independent than that of persons in a town or city.

Some of our greatest men have come from farms. Can you name two Presidents who spent their childhood on farms of the Central States? Where were their homes? What can you tell about their early life?

3. Indian corn, or maize

(1) Extent to which it is raised

Corn (Fig. 131) is raised in most of the states of the Union, and you have already learned how important it is in the South. It is in the Central States, however, that we find the greatest amount. The *corn belt* of the country (Fig. 249) extends from Ohio to central Kansas and Nebraska, with smaller quantities raised to the north, south, east, and west of it. Farmers within this belt usually expect to devote from one third to one half of their land to corn; therefore, in traveling across these states in summer, one sees cornfields in every direction.

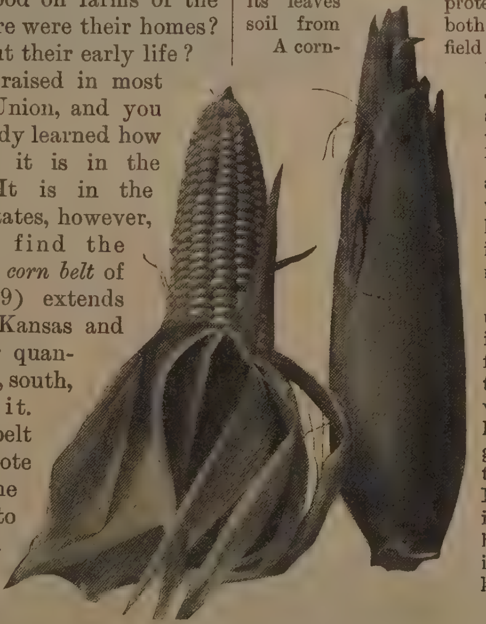


Fig. 131. — Two ears of corn, the one on the left with the husk turned down to show the kernels of corn on the cob.

(2) How it is cultivated and harvested

The seed is planted in rows in the springtime. Soon the little stalks appear above ground, growing rapidly during the hot summer months, until they reach a height of from seven to ten feet (Fig. 132). In order to keep the soil loose, and kill the weeds, the ground between the rows is plowed when the corn is young; but as it grows higher, the shade of its leaves protects the soil from both drought and weeds.

A cornfield usually presents the most beautiful appearance in July, when the corn "tassels out" (Fig. 132). The plants then entirely hide the ground from view, and the rich green stalks, with their long, slender leaves, bend to the breezes in the most graceful manner.

If the stalk is to be used as fodder for cattle in winter, it is cut before frost, when the kernels on the cob are still somewhat soft and milky. If left until after frost, the grain hardens, and then the harvest season begins. Men drive into the fields in wagons and tear the husks from the ear, spending day after day at that kind of work.

(3) Its uses

Corn is put to many uses. Much that is raised is fed to cattle and hogs, as already stated. Some is made into hominy and breakfast foods, or into corn meal. Starch is another product, and a very extensive use of the grain is in the manufacture of whisky in *distilleries*. There are many distilleries in St. Louis, Louisville, and other cities within the corn belt. Peoria, in central Illinois, is another great center for distilleries.

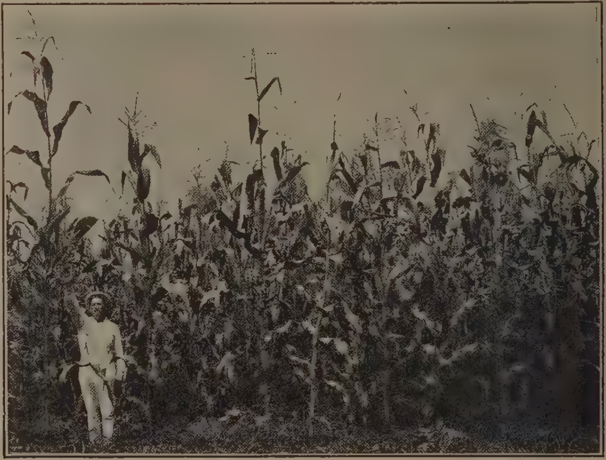


Fig. 132. — View in a cornfield in Nebraska. Notice how very tall the corn grows in this fertile soil.

4. Wheat

(1) *Extent of its production*

Wheat, like corn, is produced in all the Central States, as well as in other parts of the country (Fig. 251). It is an especially important product in Kansas, Nebraska, and Indiana; but the section which at present is most noted for wheat is the valley of the Red River of the North (Fig. 133). In this valley there is a broad, level plain, including western Minnesota, eastern North and South Dakota, and a portion of Manitoba, which is one of the finest wheat regions in the world.

(2) *Why extensively grown in the Red River Valley*

One of the reasons for the fertility of this section dates back to the time when the Great Glacier was melting away. The ice then stretched across the valley of the Red River, which flows northward into the Arctic. This ice dam prevented the river from flowing in that direction, and forced it to seek an outlet southward. A broad lake was thus formed, which was larger than all the Great Lakes put together. When the ice melted away entirely from the valley, the Red River was once more able to flow northward, and then the great lake disappeared. The soil of the wheat region is the sediment that was deposited on the bottom of this ancient lake.

The land here is almost as level as the surface of the sea; it is so level, in fact, that after a rain the water stands in sheets on the fields. It is necessary to elevate the roads a foot or more above the surrounding land and to make ditches on either side; otherwise the roads would be muddy much of the time. In every direction there is nothing to break the view except a farmhouse every half mile or so, with a few trees around it. Over this open plain

Fig. 133. — Harvesting wheat on a large farm on the plains of the fertile Red River Valley of the North.

the wind sweeps with terrific force, somewhat as upon the ocean; and in winter fierce, blinding snow squalls, or *blizzards*, are not uncommon.

(3) *How cultivated on a large farm*

Upon this plain one may ride on the train northward toward Winnipeg all day long, and see scarcely a single crop besides wheat. Most of the farms are of moderate size, but some are enormous. For example, one farm in North Dakota contains over thirty thousand acres. How many square miles is that?

This farm is divided into six parts, with farm buildings upon each. To prepare the ground, from fifteen to twenty men at a time plow and sow the seed on each division. One takes the lead, another follows behind; then comes a third, fourth, and so on. The grain is harvested on a similar plan (Fig. 133). One hundred and twenty men, and three hundred horses, are employed in the planting season, and three hundred men during the harvest. Since one acre usually produces from fifteen to twenty bushels of wheat, an immense amount of grain is obtained from this single farm.

(4) *Influence of wheat on growth of cities*

The great quantity of wheat produced in the Red River Valley and the neighboring region has helped in the growth of the cities of MINNEAPOLIS, ST. PAUL, and DULUTH. It has also caused the growth of cities in the midst of the wheat fields, like FARGO in North Dakota and SIOUX FALLS in South Dakota. Since most of the grain is shipped to the East or South, it has influenced the growth of scores of other cities along the Great Lakes, the Mississippi River, and even on the Atlantic coast. State how this can be.

5. Fruits and vegetables

(1) *Fruits*

While each farm in the Central States usually has a small orchard, like that on the Ohio farm, fruit raising is a *special* industry in those sections where the climate and soil are favorable, as in the neighborhood of the Great Lakes. You have already learned that the immense area of water in these lakes, which do not freeze over in winter, renders the summers cooler, and the winters warmer, than they would otherwise be. This is why the grape belt of western New York (p. 53) extends westward along the shores of Lake Erie far into Ohio.

The Michigan peninsula, which has Lake Michigan on the west, and Lakes Huron and Erie on the east, is also a noted fruit-raising region. Here great quantities of peaches, apples, and other fruits are produced. With what part of the Atlantic coast can this fruit region be best compared (p. 53)?

While these regions are especially noted, the raising of fruits is common in all the Central States. Among the kinds raised are peaches, grapes, apples, cherries, plums, and berries.

(2) *Vegetables*

Vegetables of many kinds, such as sweet corn, potatoes, turnips, beets, cabbages, tomatoes, peas, beans, lettuce, pumpkins, squashes, and celery are also raised in all of the Central States. Some of these are grown for use at home, some for canneries, and some for sale in the cities. The fact that there are so many cities makes truck farming profitable in their neighborhood, as is the case in New England.

6. Tobacco

Tobacco is another valuable farm product in the Central States (Fig. 256). While it is raised in many sections, the greatest quantity comes from Kentucky and Ohio, which rank with Virginia (p. 52), North Carolina, and Tennessee (p. 77) as leading tobacco states. Both LOUISVILLE and ST. LOUIS are important tobacco markets. What other cities have the same industry (pp. 52 and 77)?

7. Domestic animals

(1) *Principal kinds, and their distribution*

Some domestic animals are raised on almost every farm. Among these the most important are horses, cattle, sheep, hogs, hens, and turkeys. Some farms, however, are mainly devoted to one or a few kinds (Fig. 134). For example, in the more hilly sections, where it is not easy to cultivate grain, cattle and sheep are numerous, and dairying is important. Ohio is one of the foremost sheep raising states.

More horses are raised in Iowa than in any other state in the Union, more hogs in Iowa than in any other state, and more milch cows than in any other state except New York.

(2) The Blue Grass Region of Kentucky; its fine stock and its caverns

Kentucky is famous for its fine stock, especially horses and mules, raised in the "Blue Grass Region" about Lexington. The grass here has a bluish color, and is very nourishing, making possible the raising of fine stock.

The reason why this grass is so nourishing is that the soil in this section is made of bits of decayed limestone in which there is lime phosphate, an excellent plant food (p. 80). This phosphate comes from the shells of small animals which lived in the sea that covered this region millions of years ago (p. 6). On dying, they helped to make a deposit of sediment on the sea bottom; and this sediment has since changed to limestone rock, which is now raised above the sea. As the limestone decays, the phosphate mixes with other rock bits, and thus fertilizes the soil.

The abundance of limestone in this part of Kentucky is the reason for the numerous caves that exist there (Fig. 135). These caves are long tunnels that have been slowly eaten out by water that percolates through the rock, dissolving the limestone. The largest of all is the *Mammoth Cave*, which is said to have more than one hundred and fifty miles of tunnels, or galleries. They wind about in an irregular manner, some being many feet below others, and all together forming a network, or *labyrinth*, into which a stranger dares not venture without a guide.

8. Other farm products

Great quantities of oats and barley are raised in the Central States. The former is a common food for horses, but the latter is largely used in the manufacture of beer. The great breweries, found in every large city, consume immense quantities of barley in order to obtain the *malt* which is needed in making beer. In CINCINNATI, ST. LOUIS, and MILWAUKEE, beer making is one of the important industries.

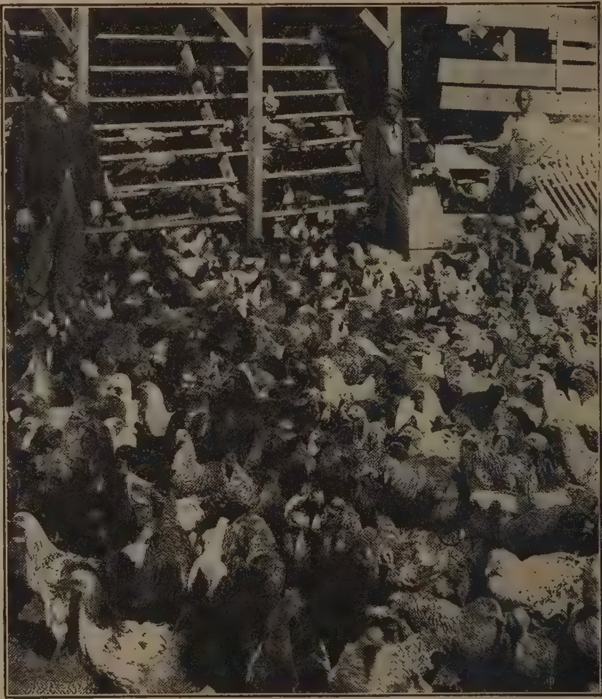


FIG. 134. — A scene on a chicken farm in Southern Missouri. There are hundreds of chickens on this farm.

Another farm crop in some sections is flax. From the bark of the flax stem a fiber is obtained which is used in making linen, while linseed oil is made from the flax seed. Hops, used with barley in making beer, are also raised; and rye and buckwheat are produced on many farms. Sugar beets are now cultivated in many states, and they supply a part of the sugar consumed in the country.

Finally, a vast amount of hay is grown; some of it is fed to farm animals, but much is sold in the cities for the use of the horses there. The hay crop is one of the most valuable in the Central States.

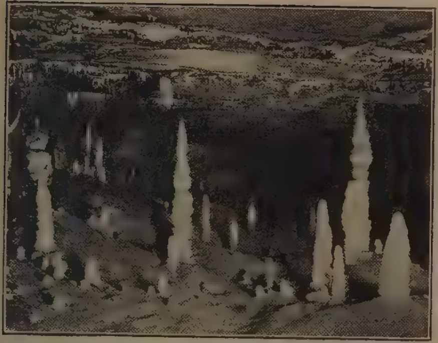


FIG. 135. — A view in one of the Kentucky caves. The icicle-like points hanging from the roof (stalactites) and the columns extending upward from the cave floor (stalagmites) are made by the deposit of limy matter that the water brings in solution as it percolates through the limestone of the cave roof.

Agriculture in the arid section

1. Meaning and extent of the Great Plains

Passing westward from the fertile valley of the Red River of the North, one finds the farmhouses decreasing in number, and the country becoming more and more arid, until, finally, in western North Dakota, there is very little farming without irrigation. At the same time, the plains gradually rise higher and higher, until, near the base of the Rocky Mountains, an elevation of fully a mile above the sea is reached. This arid plateau, extending from Canada to southwestern Texas (p. 72), is commonly known as the *Great Plains*.

2. Irrigated sections, and their products

The soil is excellent, and where irrigation is possible, there are fine farms. In many places the streams furnish water for irrigation; in others, water rises to the surface when wells are driven into the earth. Such wells, from which the water often gushes forth as in a fountain, are called *artesian wells* (Fig. 136). The water comes from the rock layers underground, and by its help much land is now cultivated which a few years ago was of little use.

Every year the amount of land cultivated in this section is increasing; and now that the government is building reservoirs to store the waters that otherwise run off through the rivers in spring, there will be still more land under irrigation. These irrigated farms produce the same crops as other parts of the Central States. Crops that will grow in a dry climate are also being introduced (called "dry farming"), and this is another reason why farming is increasing here.

3. Ranching

(1) Its extent

Still, most of the arid region of the Great Plains is unsuited to farming. For that reason there are few towns and no large cities, as you can see on the map (Fig. 125). The entire western third of North and South Dakota, Nebraska, and Kansas, as well as the Great Plains farther west, are given over mainly to *ranching* (Fig. 137).

(2) Location of the ranchman's house and corrals

This industry is carried on in much the same way throughout all parts of the arid West. In western North Dakota, for instance, there is little water except

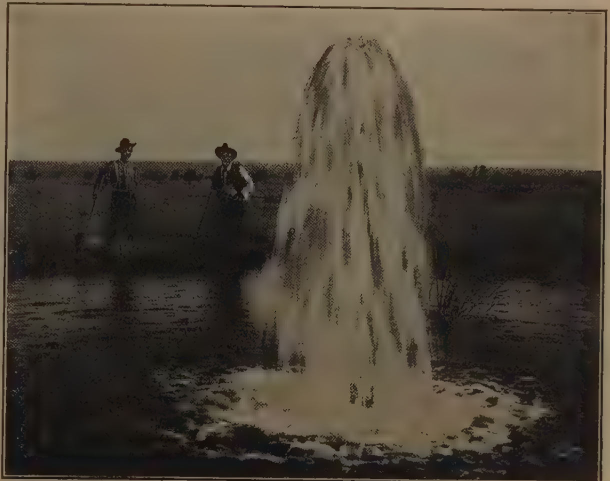


FIG. 136. — An artesian well supplying water for use in irrigation in western United States.

in the widely separated streams, and there are very few trees except along the stream banks. Since the ranchman must have both water and wood, he locates his house, sheds, and stockades, or *corrals* (Fig. 138), within easy reach of these two things. If there is no neighbor within several miles, it is all the better, for his cattle are then more certain to find abundant grass.

(3) *Why few fences*

Few fences are built, partly because most of the region is owned by the government, not by ranchmen. Very often they own only the land near the water; but this gives them control of the surrounding land, for it is of no use to any one else if his cattle cannot reach the water. Another reason why fences are not common is that it is necessary for the cattle to roam far and wide in their search for food. The bunch grass, upon which they feed, is so scattered that they must walk a long distance each day to find enough to eat.

A single ranchman may own from ten to twenty thousand head of cattle, and yet they may all be allowed to wander about upon public land, called "the range" (Fig. 137). Usually they keep within a distance of thirty miles of the ranch-house; but sometimes they stray one or two hundred miles away.

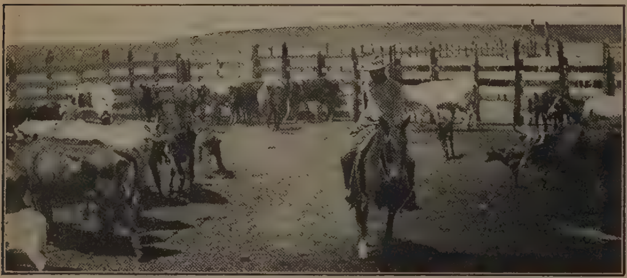


FIG. 138. — Cattle in a corral on a western cattle ranch.

Twice a year there is a general collection, or *round-up* (Fig. 139), of cattle, — the first round-up occurring in May or June, and the other early in the fall. One object of the first is to brand the calves that have been born during the winter.

(4) *Object of first round-up, and how accomplished*

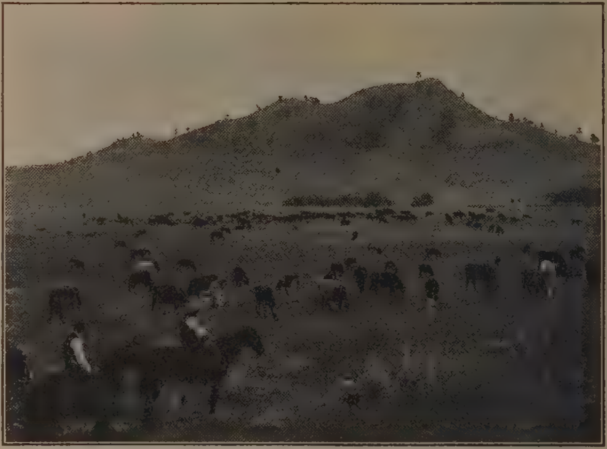


FIG. 137. — Cowboys and cattle on a ranch in western United States.

Since there are few fences, cattle belonging to ranches which are even a hundred miles apart become mixed during the winter; and those in a large herd may belong to a score of different ranchmen. Each cattle owner has a certain mark, or *brand* (Fig. 140), in the form of a letter, a cross, a horseshoe, etc., which is burnt into the side of every calf.

A round-up, which lasts several weeks, is planned by a number of ranchmen together. A squad of perhaps twenty cowboys, with a wagon and provisions, a large number of riding horses, or "ponies," and a cook, go in one direction; and other wagons, with similar "outfits," set out in other directions. Before separating in the morning, the members of a squad agree upon a certain camping place for the night, and they then scour the country to bring the cattle together, riding perhaps sixty or eighty miles during the day.

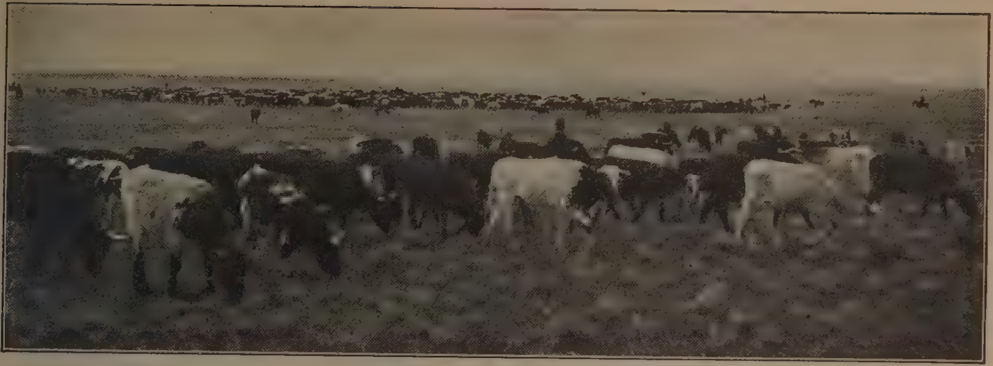


FIG. 139. — A round-up on the Great Plains. All the cattle in the distance belong to one ranchman; those in the front of the picture to another.

Each ranchman knows his own cattle by the brand they bear; and since the calves follow their mothers (Fig. 140), there is no difficulty in telling what brand shall be placed on them. After branding the calves, each ranchman drives his cattle homeward, to feed during the summer within a few dozen miles of their owner's home.

(5) *Second round-up, and what follows*

The second large round-up is similar to the first, except that its object is to bring together the *steers*, or male cattle, and ship them away to market; it is therefore called the *beef round-up*. A ranchman who owns twenty thousand cattle may sell nearly half that number in a season. As the steers are collected, they are loaded upon trains and shipped to distant cities to be slaughtered (p. 109).

Very often the cattle have found so little water, and such poor pasturage, that they have failed to fatten properly, and must be fed for a time before being slaughtered. This may be done upon the irrigated fields near the rivers in the ranch country; or the cattle may be sent for this purpose to the farms farther east, as in Kansas, Missouri, Iowa, and Nebraska.

(6) *Life of the ranchman*

The lives of ranchmen and cowboys are interesting and often exciting, most of each day being spent in the saddle (Fig. 141). They are so far separated from other people that they must depend upon themselves far more than most people do. For instance, a ranchman must build his house, kill his beef and dress it, put up his ice, raise his vegetables, do his blacksmithing, find his fuel, and even keep school for his children if they are to receive an education. He affords a good example of the pioneer life which was so common in early days.

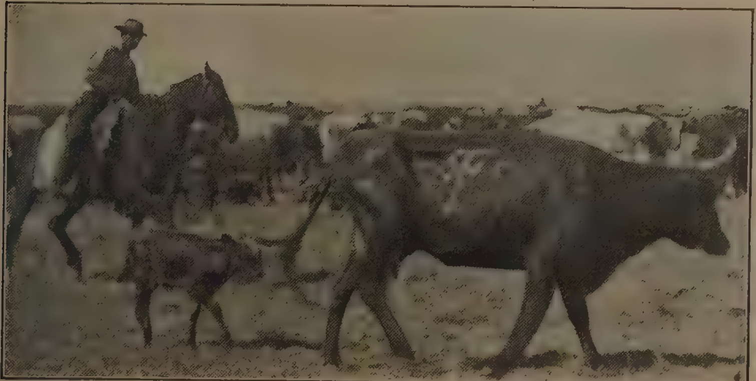


FIG. 140. — This animal bears the brand of the owner. The cowboy is trying to catch the calf that is following its mother; and when he does he will place the same brand on it.

Although so much of the land is under cultivation, or given over to ranching, forests

Lumbering

1. Extent of forest, and kinds of trees

are found in many sections. In Wisconsin, for instance, in traveling northward from the well-cultivated southern portion, one comes to a section where farmers are beginning to take the place of lumbermen. Many log huts stand here in small clearings, with the green fields still dotted by tree stumps. But beyond, little else than woods can be seen.

In these forests are many kinds of trees belonging to the north, especially the evergreens, such as hemlock, spruce, white pine, and cedar. There are also some hard woods, such as oak, birch, and maple.

2 Method of lumbering, and centers for lumber

Lumbering is still an important industry in the neighborhood of the Great Lakes. It is carried on in much the same manner as in Maine (Fig. 142), although a great deal of the timber is brought to the sawmills by wagons or rail, instead of being floated a long distance downstream.

The excellent water power in the Mississippi River, at MINNEAPOLIS (Fig. 158), early led to the building of sawmills there, and made that city famous for lumber.

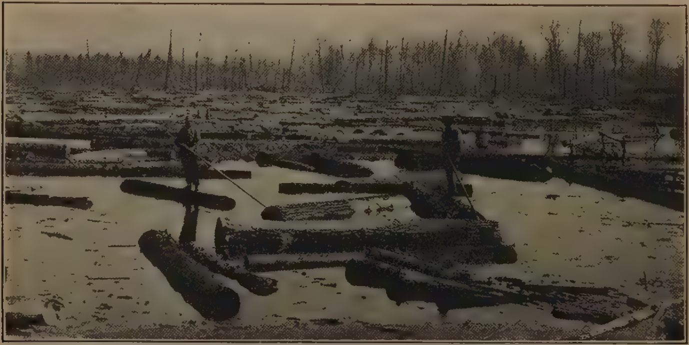


FIG. 142. — Floating logs downstream to a sawmill in Wisconsin.

Other mills are situated farther down the Mississippi, as at WINONA. They are also numerous at DULUTH, in Minnesota, and at SUPERIOR, which is just across the state line in Wisconsin.

FIG. 141. — A cowboy and his pony. The rope in his hand is his lariat, with which he lassoes the cattle.

Fishing

Since the Central States have no seacoast, all the oysters, cod, and other sea fish consumed in this section must be brought from the Pacific coast, or from the Atlantic, or Gulf coasts. Thus, while the people of these states supply meat and grain for those living in other parts of the country, they, in turn, depend upon others for some of their food.

The Central States, however, are not entirely dependent upon the sea for their fish. In the rivers there are some excellent fish, quite different from those in the ocean; and in the lakes there are still other kinds. There is, therefore, considerable fishing here, especially on the Great Lakes; but the fishing industry is by no means so important as in the groups of states already studied.

Mining

1. Coal

(1) Its wide distribution

Coal is mined in almost all the Central States. Illinois produces most, ranking next to West Virginia among the states of the country. Ohio produces almost as much, however, and large quantities come from Indiana, Iowa, Kansas, Kentucky, Missouri, and Michigan. There is so much coal in this section, and it is found throughout so large an area, that it is easy to obtain fuel for manufacturing in almost every part.

(2) *Kind of coal, and method of mining it*

While Pennsylvania produces two kinds of coal, anthracite and bituminous, the Central States have only the latter kind. But it is bituminous coal that is used in making coke, and because there is so much of this kind of coal, it is of great value for iron manufacturing. In some places the coal beds lie near the surface, like rock in quarries, and then the mining is very simple; in others it is buried so deep that long shafts must be sunk to reach it.

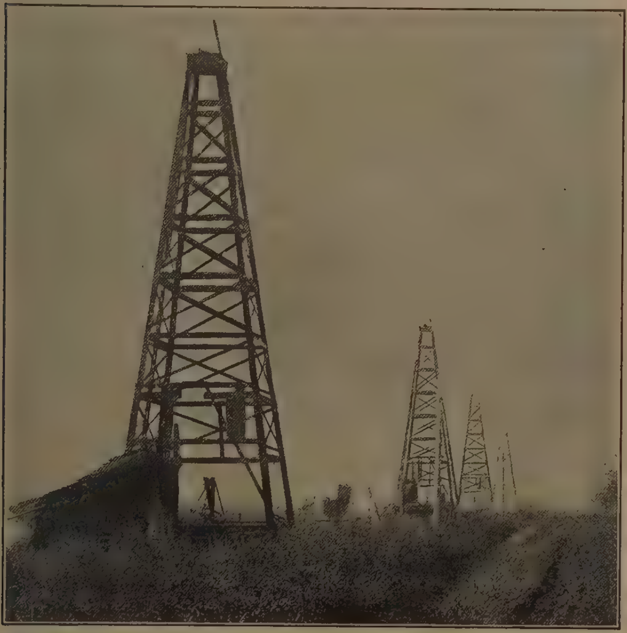


Fig. 143. — A view in the oil fields of Kansas. There is an oil well under each derrick.

2. Oil and gas
(1) *Where found*

When oil and natural gas were first discovered in New York and Pennsylvania, it was supposed that they did not exist elsewhere; but they have since been found in many places. Name some of them (pp. 56–79). Both oil and gas are found in several of the Central States, especially Illinois, Ohio, and Indiana. Many farmers, whose soil is no better than that of their neighbors, have suddenly become rich by the discovery of oil or natural gas in the rocks far beneath the surface (Fig. 143). In fact, these substances are so abundant in some places that towns, like FINDLAY in western Ohio, have sprung up like mushrooms.

The way in which gas and oil are formed, and the uses to which they are put, have already been described (p. 56).

(2) *Cheapness of gas as a fuel*

In many places in the Central States natural gas is in common use, furnishing both light and heat in the houses, and fuel in the factories. It is a very cheap fuel, for, after the hole is bored into the earth, it costs almost nothing to produce the gas. The main expense is the cost of the pipes through which it passes.

3. Iron ore
(1) *The Lake Superior district*

Formerly Pennsylvania was the chief iron-producing state, having both coal and iron ore; but some years ago explorers discovered enormous beds of iron ore near the western end of Lake Superior. In some places the ore is so soft that, like gravel, it can be dug out with steam shovels, and very often it is so near the surface that the mines are open pits. In other places the mining is done underground. That is the case, for example, at ISHPEMING, in northern Michigan (Fig. 144).

This Lake Superior district is now the leading iron-producing center of the world.

It includes parts of three states — Michigan, Wisconsin, and Minnesota, — the most important being Minnesota, — (Fig. 270), and the least important Wisconsin. These three states together produce sixty-two times as much iron ore as Pennsylvania, and four-fifths of all the iron ore of the country. The enormous development of mining in this region has caused numerous towns and cities to grow up here.

(2) *Why the ore must be transported, and from what ports*

It is a very unfortunate fact that there is no coal in this iron district. For in order that the ore may be reduced to the metal, either coal must be carried to the iron mines, or else the ore must be moved to the coal regions. The latter has proved the cheaper. Accordingly, hundreds of boats sail every year from the lake ports of DULUTH, SUPERIOR, ASHLAND, and MARQUETTE, loaded with ore for the manufacturing centers along the lakes.

(3) *How it is loaded, and where sent*

Fortunately the iron deposits are located near waterways. If it were necessary to haul the heavy ore a long distance by rail, the expense might be so great as seriously to check its production. As it is, however, the ore is mined, loaded upon cars, and sent over short lines of railway to the lake shore.

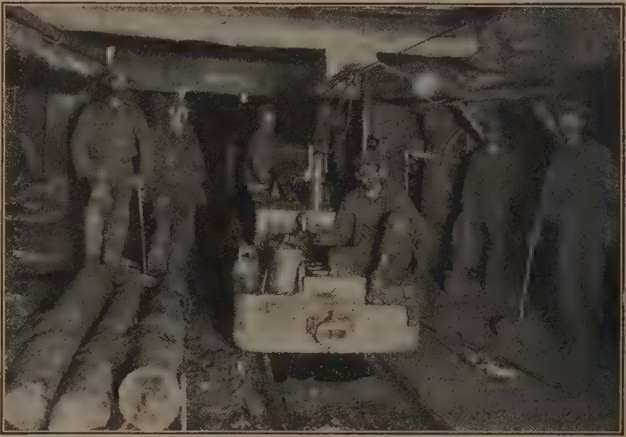


FIG. 144. — An electric motor in an iron mine at Ishpeming, Michigan.

Great ore docks (Fig. 145), or piers, reaching out into deep water, have been built to hold the ore. Railway tracks are laid upon the docks, and the trains run out upon them to dump their contents quickly into bins. On a single pier there are scores of bins, which together hold enough ore to fill several large vessels. When a vessel is to be loaded, it comes up to the pier; then a door at the bottom of a bin is opened, allowing hundreds of tons of ore

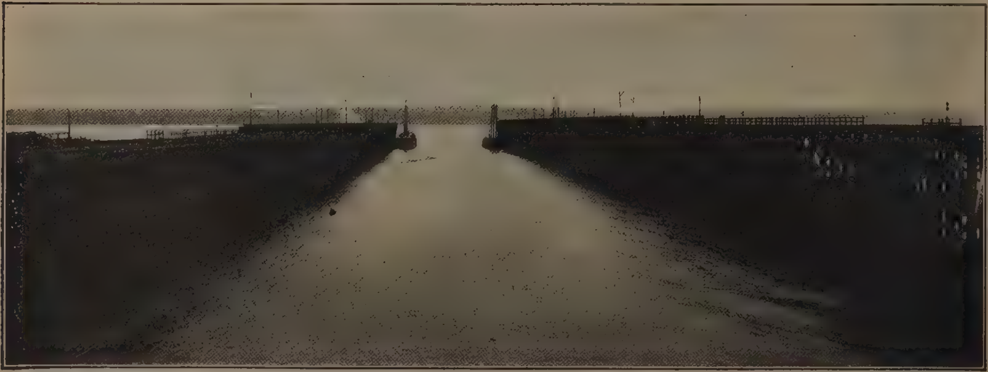


FIG. 145. — The great ore docks on the shores of Lake Superior. Trains loaded with ore run out onto these docks and dump their ore into large bins up to which vessels come to be loaded.

to slide out. After this, the next bin is emptied, and in this way the vessel is filled in a few hours.

As the ore must reach a point where coal is easily obtained, it is taken to such lake ports as Chicago, Detroit, Toledo, Cleveland, and Buffalo. Notice how close to these cities the coal beds extend (Fig. 268). From the lake ports the ore is also carried by rail to Pittsburgh, as well as to many other places in the midst of the coal fields.

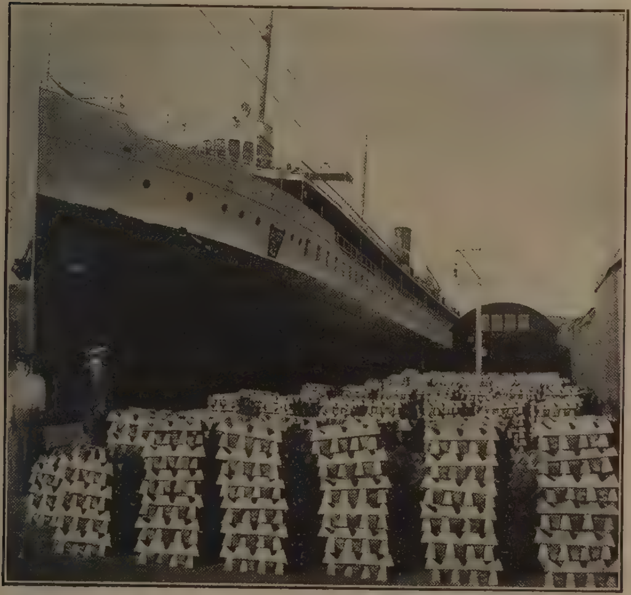


Fig. 146.—Bars of copper on the dock at Houghton, Michigan. These are to be carried away by the large lake steamer.

4. Copper ore

(1) Uses of copper

Another metal found in the Central States is copper, which is valuable in many ways. It is one of the metals used to make bronze, and also brass; but of late years a new and even greater demand for this metal has arisen. Electricity passes through copper more easily than through other common metals; copper is, therefore, the best material for trolley wires, for the wire of long-distance telephones, and for wire used in electric lighting. Since the use of electricity is rapidly increasing, there is a growing demand for copper.

(2) Where the ore is found

The Indians and early explorers found pieces of copper on the surface of the ground in northern Michigan. Later it was discovered there in the pores of a lava rock, and between the grains of a pebble beach which was formed in the ancient sea, and has since hardened into rock. These copper-bearing rocks are found on the small peninsula that extends into Lake Superior near Houghton. Copper mines were started there long ago, and for many years that has been one of the leading copper-mining regions of the world.

(3) How copper is obtained from the ore, and where sent

Some of these mines are very deep, one of the shafts reaching to a depth of about a mile. When the ore is drawn to the surface, it is found mixed with so much beach rock and lava, that it must first be crushed to a powder under powerful hammers, or *stamps*. Then water is run over it, in order to carry away the bits of rock and leave the heavier particles of copper. Even after this, some foreign substances are still mixed with the copper, and these must be removed before the metal is fit for use. In order to remove them, the copper is next placed in a large *smelter* and melted. The pure copper is allowed to run out of the furnace and cool in bars to be shipped away (Fig. 146). Among the foreign substances is a little silver, which is carefully saved.

As in the case of iron ore, the copper is shipped to points along the lakes, and elsewhere, by water and by rail. Much of it goes to the metal manufactories in the New England cities (p. 43). Name some goods that must be shipped *into* this section instead of away from it. Why?

(4) *Population dependent on these mines*

The largest of the copper mines are near together, and so many men are employed in obtaining the ore, and in getting out the pure metal, that large towns have grown up near the mines. Within a few miles of the most important mines are several towns, the largest being CALUMET. Many of these persons are miners and families of miners; but there must, of course, be storekeepers, physicians, teachers, ministers, etc.; and they all depend for a living upon the precious copper buried far beneath the surface.

5. Other mineral products

(1) *Building stones, sand, and clay*

There is an abundance of *building stones* in the Central States. Among these are sandstone and limestone, which are shipped in all directions for building purposes. Limestone is also used in iron smelting and in making Portland cement. In addition, there are slates and granites in the hilly and mountainous sections, as there are in New England (p. 36).

Several states produce much *sand*, which is melted and made into window glass, bottles, and other objects. Clay of various kinds, used in making brick, tiles, or pottery is abundant in all the states.

(2) *Lead, zinc, and gold*

Lead and zinc, two other metals found in the Central States, occur in pockets and little veins in layers of limestone. The ores are mined in many places, as at JOPLIN, Mo., and then sent to furnaces, where the pure metals are separated from the ore. A large part of our supply of lead and zinc is obtained from Missouri. What are some of the uses of these metals? Of what use should you think this lead was to the early pioneers?

Gold and *lignite* are mined in considerable quantities in the Black Hills in the extreme western part of South Dakota.

(3) *Salt*

Much salt is obtained in the Central States, especially in Michigan. This state produces more salt than any other in the Union, New York ranking second, Ohio third, and Kansas fourth.

Manufacturing

The abundance of coal, gas, and water power, together with raw materials, has led to very extensive manufacturing in the Central States.

1. Manufactures from agricultural products

Great quantities of corn are consumed in making corn meal, hominy, starch, and breakfast foods; and some is also used in distilleries (p. 96). There are many flour mills where wheat is made into flour; large quantities of oats are made into oatmeal; and much barley is consumed in the breweries. Canning of fruits and vegetables is extensively carried on at many places, and the making of sugar from the sugar beet has come to be of great importance.

The ranches in the arid section, as well as the farms in general, supply animals from which meat, lard, soap, and various other products are made in several of the large cities. The hides of these animals are made into shoes, gloves, traveling bags, and other articles, while the wool is manufactured into clothing. Cotton is brought from the South to be made into cotton goods. Much butter and cheese is made in every state.

2. Manufactures from forest products

Near the forests, both along the streams and on the shores of the Great Lakes, the manufacture of furniture and other articles of wood is an important industry. On many of the rivers of Minnesota, Wisconsin, and Michigan, where there is abundant water power, there are sawmills, furniture factories, and planing mills. Some of the most important are located in OSHKOSH in Wisconsin, and SAGINAW, BAY CITY, and GRAND RAPIDS in Michigan. School desks, office desks, chairs, tables, and other kinds of furniture are made at Grand Rapids, which city is especially noted for the manufacture of furniture. CHICAGO manufactures furniture to a considerable extent.

3. Manufactures from mineral products

(1) *Manufactures from oil and ores*

The crude oil is made into many products, as in the Middle Atlantic States. Name some of these products (p. 56).

The manufacture of iron ore into iron and steel goods occupies an enormous number of men in hundreds of cities and towns. The manufacture of copper goods is another extensive industry, and many products are made from lead and zinc.

FIG. 147. — The employees of a large manufacturing plant in Dayton, Ohio, at luncheon.

Metal manufacturing in the Central States is quite as important as in the states along the Atlantic coast, and the industry is rapidly growing (Fig. 147).

(2) *Manufactures from clay and limestone*

Much of the deep soil left in the prairie states by the glacier is a clay which is useful in the manufacture of bricks. As in other sections of the country (p. 59), there are many brickyards, especially near the large cities. From this same kind of clay, flowerpots, drainpipes, and other articles are made. During recent years, when drainage of farm land has become common, the manufacture of tile for that purpose has developed into a great industry. Many a small town has a tile factory.

A very high grade of pottery, known as Rookwood ware, is manufactured in CINCINNATI. The best of clay is needed for this, and it must be brought from a distance. The first step in making a vase is to wet a lump of clay so that it may easily be molded. Then it is placed upon a potter's wheel, where it is whirled rapidly around while a man molds it with his hands. In a very few minutes he changes the shapeless lump into a delicately formed vase. It must then be baked, and after the baking, flowers or other ornaments may be painted upon it. The surface is finally covered with a substance which, when baked, produces a *glaze*. One of the beauties of the Rookwood ware is the peculiar color of the glaze, which is a dark or yellowish brown.

In Missouri, Indiana, Michigan, Ohio, and other states of this section, Portland cement is made from limestone. Pennsylvania produces most cement, but several of the states produce large amounts.

Transportation of goods

The handling of so many raw materials and manufactured products leads to extensive commerce. The transportation of bulky goods, such as ores, coal, and wheat, is particularly important where the coal and iron ore are so widely separated, and where far more wheat is raised than can be consumed.

The importance of the Great Lakes in bringing the ores to the coal and the wheat

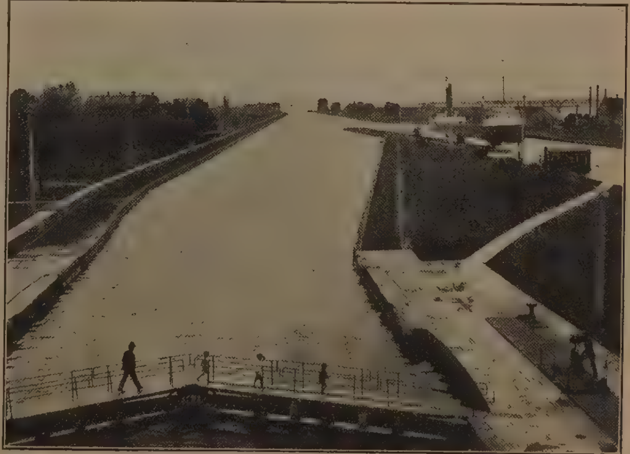


FIG. 148. — The "Soo" Canal. Boats going west pass through the canal on the right; those going east pass through the canal on the left. In the very front of the picture is the gate of a lock.

to the Eastern markets is evident. From Duluth to Buffalo there is only one place where navigation is interfered with. That is at the outlet of Lake Superior into Lake Huron, where there are some rapids. Here a broad canal, large enough for the great lake vessels, has been dug. It is called the *Soo Canal* (Fig. 148), after the city SAULT STE. MARIE, located at this point.

The Mississippi, Ohio, and Missouri rivers, with many smaller tributaries, drain almost the entire area of the Central States. Which parts are not in the Mississippi River drainage area? The three rivers named, as well as many smaller ones, are navigable. Thus the Great Lakes and the rivers together afford admirable water transportation for goods in all directions.

Railroads have been very easily built in this level country, and they connect these two vast water ways at many points. Most of the great railroad systems that cross the continent from east to west pass through either Chicago or St. Louis.

Principal cities along the Great Lakes

Since the Central States have no ocean coast, we naturally find the principal cities along the Great Lakes and the three great rivers, where it is possible to ship goods by water. Let us first consider those along the Great Lakes.

1. Duluth and Superior

At the western end of Lake Superior there is a fine harbor, one side being in Minnesota, the other in Wisconsin. Upon this harbor are two cities, DULUTH and SUPERIOR, which together have a population of over one hundred thousand. The chief products of this vicinity are iron, lumber, and wheat, which are shipped eastward in immense quantities from these two ports. Owing to the nearness of these cities to the Minnesota and Dakota wheat fields, there are enormous elevators for storing grain, and flour mills for grinding it into flour.

Goods are shipped to this point as well as from it, for the people in this section must depend upon other people for their farming implements, clothing, various kinds of food, furniture, and coal. These goods are brought cheaply, because the vessels carrying ore, wheat, and lumber eastward must have a cargo to bring back. Explain how the products of this region help to make Buffalo, Montreal, and New York important, and to keep the mills and factories of New England busy.

2. Chicago

(1) *History of this region*

Locate Chicago. At this point the small Chicago River empties into Lake Michigan (Fig. 149), forming a small harbor, on which a fort was located in early times.

The harbor itself was formed thousands of years ago, while the Great Glacier was melting away. At that time, the ice sheet lay across Lake Michigan, forming a huge dam which prevented the water from flowing into Lake Huron, and through the St. Lawrence River to the sea, as it now does. This forced the water to find an outlet southward, past the present site of Chicago, into the Illinois River, and thence, by way of the Mississippi, into the Gulf of Mexico. It was the wash of this water that dug out the small harbor.

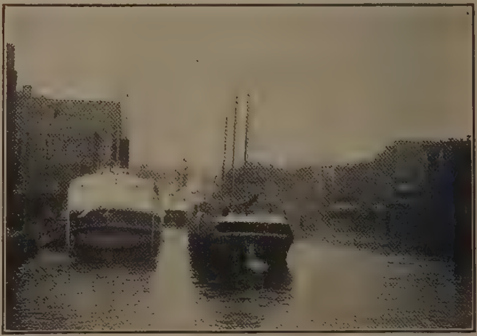


FIG 149. — Shipping on the Chicago River. This was the first port at Chicago, but now breakwaters built out into the lake make a large harbor.

(2) *Advantages of this site*

As the West developed, this site proved to be a most favorable one; for whenever a railway was built from the East to the Northwest, it was necessary for it to pass around the southern end of Lake Michigan. As the city grew in size, other railways were built to it *because* it was large; and now they approach it from the east, west, north, and south (Fig. 150). Thus Chicago has become a great railway center.

The city is an important shipping point for grain, because it lies in the midst of the most productive grain region in the world.

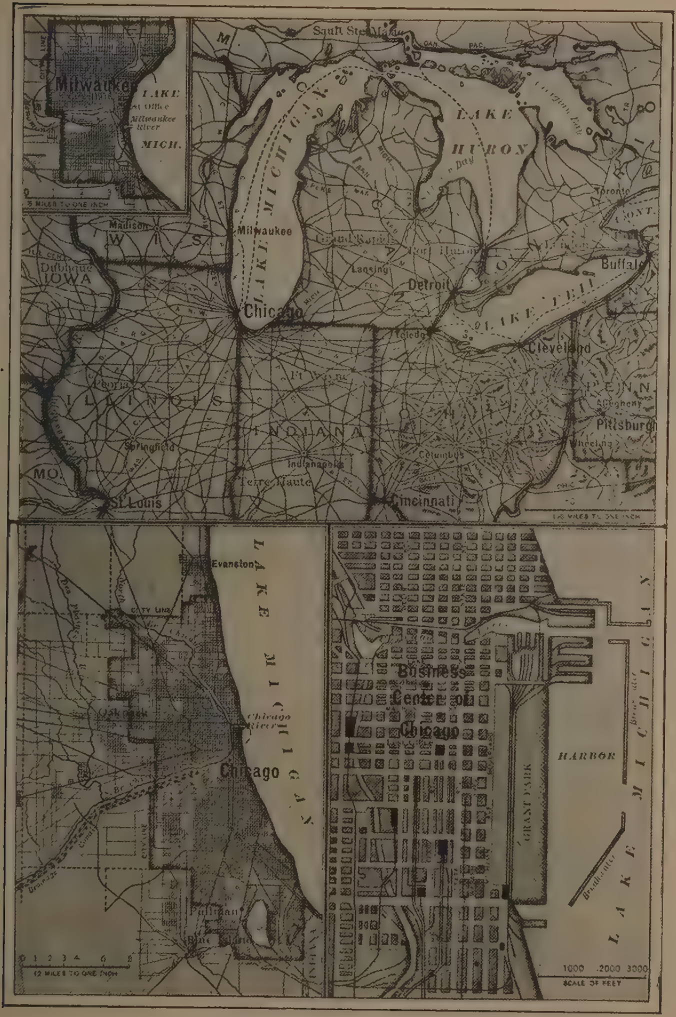


FIG. 150. — Map showing the location of Chicago and Milwaukee.

It is also within easy reach of extensive coal fields, while lumber and iron ore are readily brought to it by boat. These facts have caused Chicago to have a wonderful growth. In the year 1840, there were but 4470 inhabitants; in 1870, 300,000; in 1910, 2,185,283; and now it is the second city in size in the New World. It has long since outgrown its small natural harbor, and a much larger one has been made by building long breakwaters out into the lake.

(3) *Meat packing and related industries*

Chicago is not only a great grain market, but also the most important meat market in the world. All the grazing states of the West ship stock to this point, and in the city itself nearly a square mile is taken up by the Union Stock Yards (Fig. 151). In these are large sheds for the various kinds of stock, pens with high fences, and troughs for food and water (Fig. 152). Train loads of cattle, hogs, and sheep are unloaded here every day. The work employs about thirty thousand men.

The packing houses send out a number of products. By far the most important is meat, for most of the cities of the East are furnished with fresh meat from Chicago and other Western cities. Both live cattle and fresh meat are sent in large quantities to Europe also. It may be several weeks after the meat is prepared for food before it reaches the table; yet all this time it is kept fresh by the use of ice. Special refrigerator cars are built for the sole purpose of carrying it.

Besides the meat that is sold fresh, a great deal is canned. The fat of the hog is made into lard, and not a little beef fat is made into imitation butter, called oleomargarine. Many of the bones are burned and used in the manufacture of sugar (p. 76); and the horns and hoofs are of use in making gelatine and glue. The hides are made into shoes, gloves, harnesses, and other leather goods. Nothing is wasted in the packing business; even the bristles of the hog are saved and made into brushes; and the hair from the hides of cattle is valuable in making plaster.

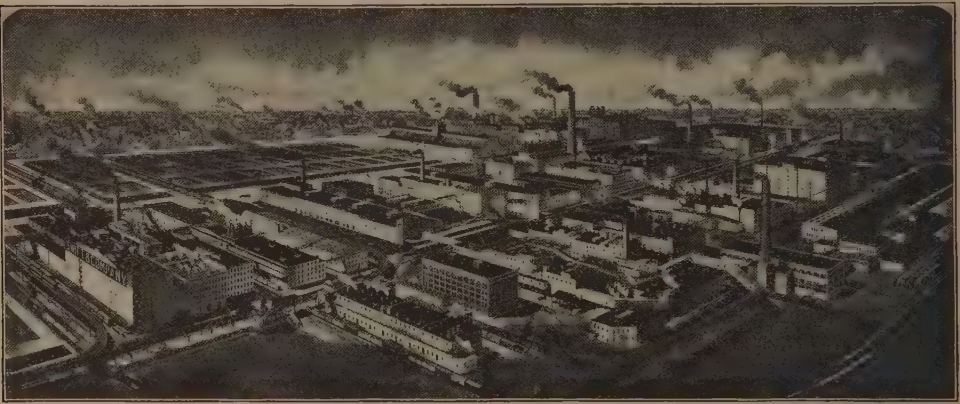


Fig. 151. — A general view of the stock yards at Chicago.

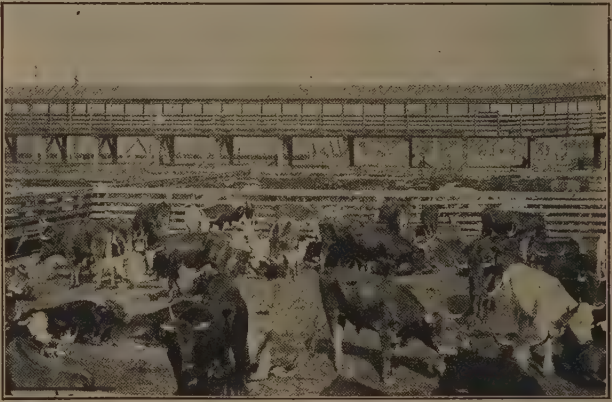


Fig. 152. — A view of a small part of the stock yards (Fig. 151), showing cattle in the pens.

It is from the Western packing houses that the shoe factories of Lynn, Haverhill, Brockton, and other cities are supplied with much of their leather. The hides, however, must first be sent to tanneries. One of the principal places for tanneries is Milwaukee, which obtains tannic acid from the bark of the hemlock tree that grows in the forests of Wisconsin.

(4) Other manufacturing

There are many companies engaged in the making of iron and steel goods; one of them alone, the Illinois Steel Company, employs ten thousand men. An enormous amount of furniture is made, and the manufacture of farming implements is also very extensive. Chicago is the home of the National Harvester Company, which controls the manufacture of farming implements in most parts of the country. A single one of its plants sends out about three hundred thousand farm machines every year. The Pullman Car Works made as many as ten thousand freight cars in one year, besides several hundred Pullman and passenger cars. As in New York (p. 63) and other great cities, the making of clothing is one of the most important industries. These are but a few of the kinds of manufacturing in this great city where there are thousands of factories.

(5) *Transportation and sewage*

Like other very large cities, Chicago has much difficulty in providing transportation for the people of the city. Street cars are one important means, and many steam railways carry passengers to and from the heart of the city. There are elevated railways (Fig. 153), also, as in New York, and underground roads, as well. But unlike New York, the underground roads are used mainly for hauling freight.

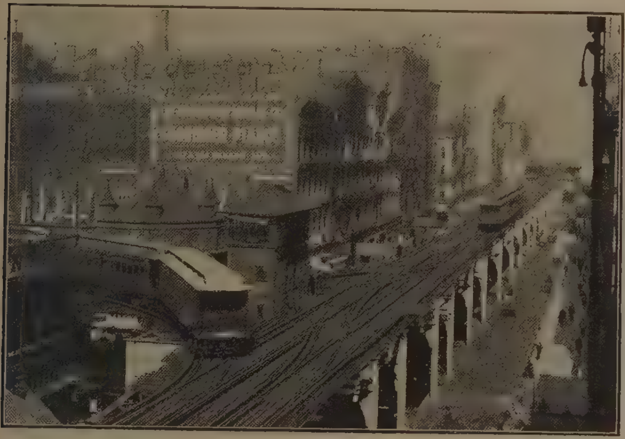


FIG. 153. — A view of the elevated railway in Chicago at the point known as the Union Loop.

Another great difficulty has been the proper care of the sewage of the city. For a long time it was poured into Lake Michigan; but as the drinking water was taken from the lake, this became very dangerous to the health of the people. In order to carry it away, an immense drainage canal has been dug (Fig. 150), connecting Lake Michigan with the Illinois River, and thus setting the current toward the Mississippi and the Gulf of Mexico. This drainage canal, which is wide and deep enough for boats, may in time develop into a ship canal. In that case, large ships may reach Chicago from the Gulf of Mexico, as they now do from the Gulf of St. Lawrence. What effect would this have upon the city?

(6) *Education*

Chicago has an excellent system of education, from the lowest grades to the university, and hundreds of buildings are given up to this work alone. The chief educational institution is the University of Chicago, which, although established as recently as 1890, now has more students than some of the older universities of the East. At EVANSTON is the Northwestern University; and at CHAMPAIGN the University of Illinois, one of the most progressive and rapidly growing of the state universities.

3. Milwaukee and Racine

Other large cities along the lakes are engaged in many of the same industries as Chicago. MILWAUKEE (Fig. 150), the largest city in Wisconsin, deals extensively in grain, lumber, and leather, packs much pork, and manufactures a great quantity of flour and machinery. Its tanneries and immense breweries have already been mentioned (pp. 98 and 110). Locate RACINE, a smaller but important lake port.

4. Detroit and Ann Arbor

DETROIT (Fig. 154), the largest city in Michigan, is also on the Great Lakes water route. The name is a French word for *strait*. Why is that name suitable here? All vessels going east or west must pass this city, and some railroads connecting the East and the West either cross the strait at Detroit or pass under it by a tunnel. Being at the crossing of important railway and steamship lines, Detroit has become a great shipping and manufacturing center. It deals in grain, wool, pork, and ores from the West, and makes iron and steel goods.

Not far away, at ANN ARBOR, is the University of Michigan, one of the largest in the United States. It is supported by the state. In fact, state universities are established in most of the Central, Southern, and Western States. Some are located at the state capitals: for instance, the University of Ohio is at Columbus, the University of Wisconsin at Madison, and the University of Nebraska at Lincoln. Others, like the universities of Illinois, Missouri, and Michigan, are located at other places than the capital. If there is one in your state, where is it?

5. Cleveland and Toledo

On the lake shore in Ohio the chief cities are TOLEDO and CLEVELAND (Fig. 154). The former has extensive flour mills and iron manufactories; and the latter, which is a much larger city, being even larger than Cincinnati, Detroit, or Buffalo, has an important trade in grain, lumber, and ore. The situation of Cleveland near the coal and petroleum fields has led to extensive manufacturing of machinery, furniture, and other goods. Much petroleum is refined here, and the building of ships for the lake commerce is an important industry.

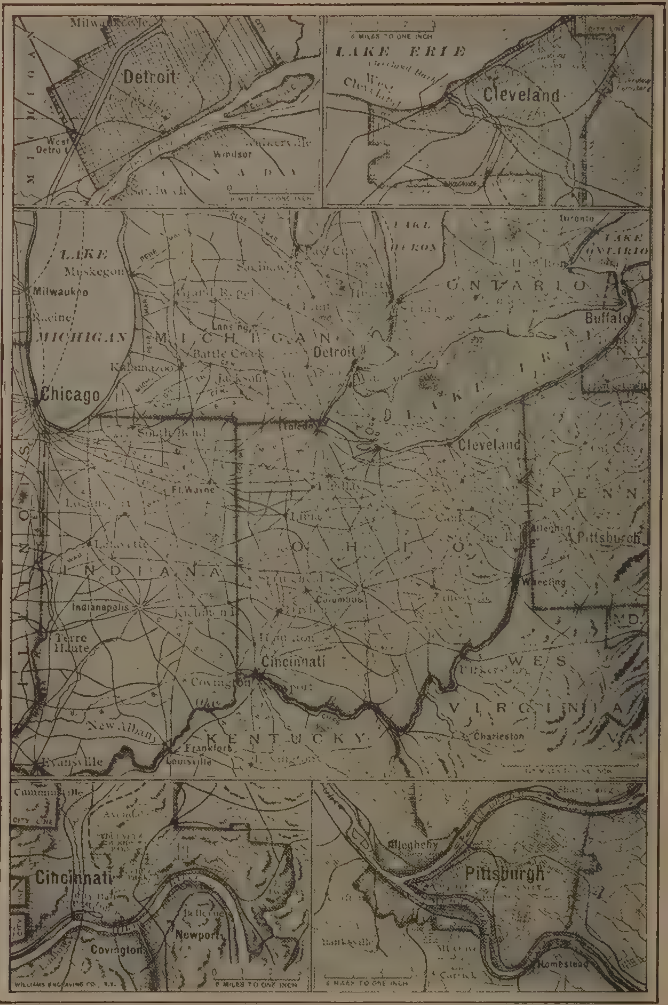


FIG. 154. — Map showing the location of Detroit, Cleveland, Cincinnati, and Pittsburgh, and their relation to the trade routes of the Central and Middle Atlantic States.

Principal cities along the rivers

1. St. Louis

(1) *Its location*

The largest city on the rivers, corresponding to Chicago on the lakes, is ST. LOUIS, the fourth in size among our cities (Fig. 157). It has a very favorable position in the center of the

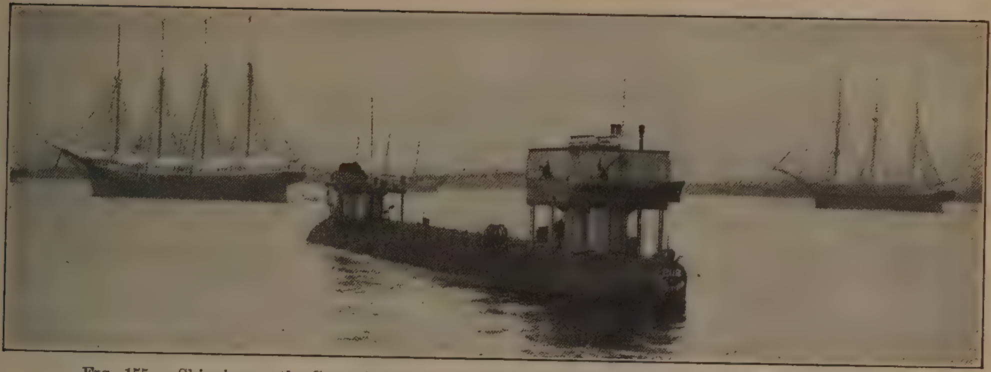


FIG. 155. — Shipping on the Great Lakes. The peculiar ship in the foreground is called a whaleback.

Mississippi Valley, on the Mississippi River, near the mouths of its two largest tributaries. The railway bridges across the Mississippi at this point have also had great influence on the growth of the city. It is an important shipping point both by water and by rail.

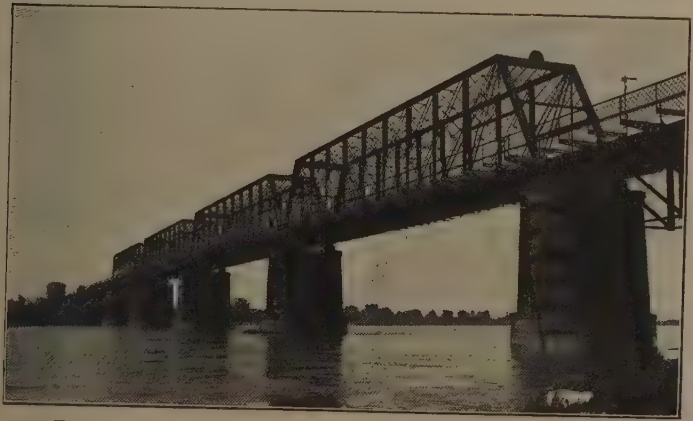


FIG. 156. — A railway bridge across the Missouri River above St. Louis.

(2) Its industries

Like Chicago, St. Louis is one of our leading markets for grain and live stock; but, being so far south, it handles Southern products also, especially cotton and tobacco. Besides this, it is a great manufacturing center. It manufactures immense quantities of tobacco, beer, flour, clothing, iron, steel goods, and is the greatest manufacturing center of boots and shoes in the United States.

2. St. Paul and Minneapolis

At one time Chicago and St. Louis were almost the only noted markets for grain and live stock in the West; but in later years several other cities have become prominent. Two of these are the "twin cities," MINNEAPOLIS and ST. PAUL (Fig. 157), both on the Mississippi River. The latter, the capital of Minnesota, is a trade center. From it the products of the West are sent east and south, while farm implements, furniture, clothing, and other articles are distributed among the smaller towns round about.

MINNEAPOLIS, only ten miles distant, is situated at the Falls of St. Anthony, which furnish splendid water power (Fig. 158). Its location in the midst of the wheat region, together with its water power, has caused Minneapolis to become the leading flour-producing center of America. In the city are many sawmills, grain elevators, and flour mills.

One of these flour mills, belonging to the Pillsbury-Washburn Company, is one of the largest in the world. Steam shovels scoop the grain from the trains very rapidly, emptying a car of 750 bushels in eighteen or nineteen minutes. All straw, useless seeds, sticks, etc., are first separated from the grain; then it passes through different machines until the pure flour is produced. During this process it is raised to the top of the building twelve different times, being carried up by rapidly moving belts having many small buckets, or pockets, attached.

Just inside the husk of a wheat grain is the kernel, the most valuable part of the wheat. The husk is removed by machinery, and sold for bran and shorts, and the center, called the heart, or germ, is made into breakfast food. The other portion is ground into flour, poured into sacks and barrels by machinery, and then sent sliding down a chute into the cars which stand near by. This one mill has ground as much as 61,000 barrels of flour in one day. One year the daily output of five mills was about 36,000 barrels.

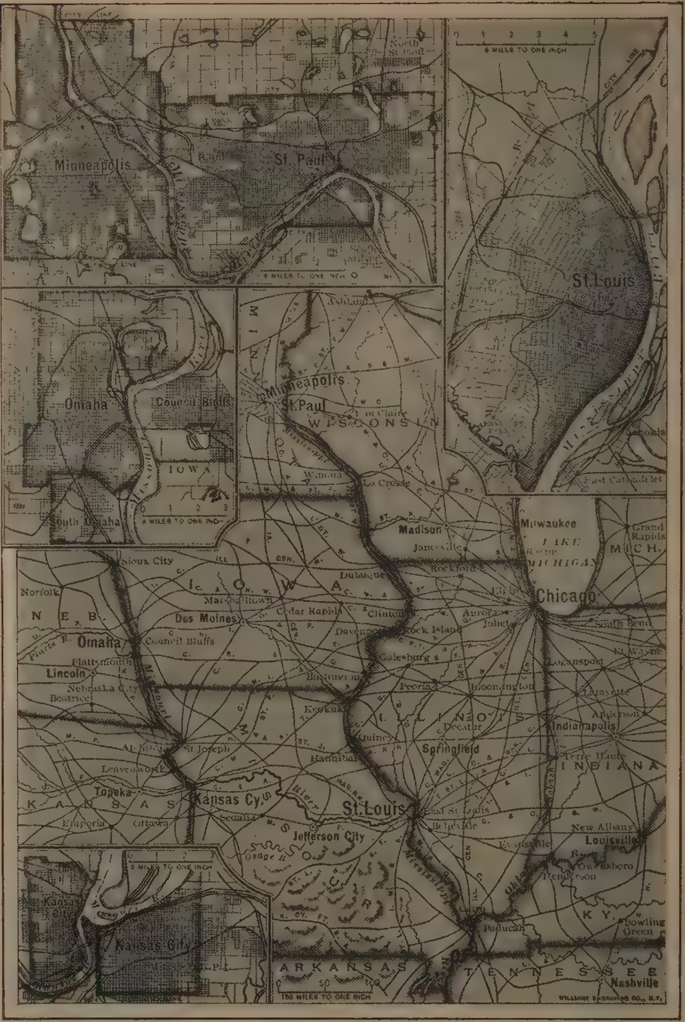


FIG. 157.—Map showing the location of St. Louis, Kansas City, Omaha, Minneapolis, and St. Paul.

3. Other cities on the Mississippi

Smaller cities on the Mississippi River waterway, between Minneapolis and St. Louis, are WINONA, in Minnesota; LA CROSSE, in Wisconsin; DUBUQUE and DAVENPORT, in Iowa; and QUINCY, in Illinois. Find each. Each is important either for lumber, grain, or farming implements, or for all three combined.

4. Cities on and near the Missouri

The leading cities on the Missouri River are KANSAS CITY (Fig. 157), in western Missouri, and OMAHA, in Nebraska. Each is surrounded by a fertile farming country, which produces much grain. Each is also a market for cattle, sheep, and horses raised near by and in the arid region farther west. Being so near the ranch country, the meat-packing industries in both of these cities are gaining rapidly each year. Note that there is also a Kansas City in Kansas.

FIG. 158. — The St. Anthony Falls at Minneapolis — some of the factories are seen in the distance.

On the river above Kansas City is ST. JOSEPH, in Missouri; and below it is JEFFERSON CITY, the capital of that state. Farther west, in Kansas, are TOPEKA, the capital, and WICHITA. Southwest of Omaha is LINCOLN, the capital of Nebraska; and across the river, in Iowa, is COUNCIL BLUFFS, a very active trading center. Several cities northwest of this point are chiefly important as trade centers. Find some of them on the map. Locate DES MOINES, the capital and largest city of Iowa. Of what advantage is its central position in a level farming country.

5. Cities in the Ohio Valley

In the Middle Atlantic States, Pittsburgh, and Wheeling, on the upper Ohio, owe their importance largely to coal and iron, and to the fact that river boats can reach them. Farther down the river is CINCINNATI (Fig. 154), the largest river port in the state of Ohio, and a busy shipping and manufacturing center (Fig. 159). Besides pottery (p. 107), this city manufactures large quantities of iron, machinery, and clothing. Across the river, in Kentucky, are COVINGTON and NEWPORT (Fig. 154), both almost a part of Cincinnati, as Jersey City is almost a part of New York.

Farther north and east, in Ohio, are DAYTON and SPRINGFIELD, both noted for the manufacture of farm machinery. DAYTON, like Pullman in Chicago, makes a large number of cars, and is engaged in manufacturing of many kinds. COLUMBUS, the capital of Ohio, is an important trade center, and manufactures many carriages and wagons. Why should farm machinery, carriages, and wagons be manufactured in so many of these cities?

Down the river, below Cincinnati, is LOUISVILLE, the largest city in Kentucky. There are rapids in the Ohio at this point, but a canal leads around them. Besides

FIG. 159. — River boats on the Ohio at Cincinnati.

being a center for tobacco, like Richmond and St. Louis, Louisville manufactures iron goods, farming implements, flour, and leather goods. It is also a railway center.

EVANSVILLE, the largest river port in Indiana, is principally engaged in the manufacture of flour, machinery, and leather goods. INDIANAPOLIS, the capital and metropolis of Indiana, is in the midst of a splendid farming district. Like Columbus, it is a railway and trade center, and handles much grain, lumber, furniture, and many farming implements.

Review Questions

1. To what extent is the land level in the Central States? 2. What about forests and bowlders there? 3. Describe the temperature, giving reasons for the extremes. What is meant by a continental climate? By an equable climate? 4. What about the rainfall? 5. State the importance of agriculture. Describe the farm in central Ohio, and the farm life. 6. To what extent is Indian corn raised in these states? 7. How is it cultivated and harvested? 8. What are its uses? 9. How extensively is wheat produced, and in what sections? 10. Describe wheat raising on the large farm mentioned. 11. What cities have been much influenced in growth by the wheat raised in the valley of the Red River of the North? Why? 12. What fruits are grown, and where? 13. What vegetables? 14. Where is tobacco raised? 15. What are the principal domestic animals raised, and where? 16. What can you tell about the fine stock in Kentucky, and the caverns there? 17. Name other important farm products east of the arid lands. 18. What is meant by the Great Plains, and what is their extent? 19. How is irrigation carried on, and what are the products of the irrigated farms? 20. Tell about ranching; its extent; how it is carried on; and a ranchman's life. 21. What is the extent of forests in these states, and what kind of trees are there? 22. Describe the method of lumbering, and name the centers of the industry. 23. What about fishing in these states? 24. Where are the coal mines, and what is the kind of coal? Where are oil and gas found? 25. Why is gas an especially cheap fuel? 26. Locate the Lake Superior iron ore district, and tell about its importance. 27. Why must the ore be taken elsewhere to be smelted, and from what ports? 28. How is the ore loaded on to the vessels, and where is it taken? 29. What are the uses of copper? 30. Where is copper ore found? 31. How is the copper obtained from the ore, and where is it sent? 32. How have the copper mines influenced settlement? 33. What about building stones in these states? 34. Name other mineral products, and tell where found. 35. What are the leading kinds of manufacturing from the agricultural products? 36. Name the principal kinds of manufacturing from forest products, and the chief cities engaged in them. 37. What about the importance of the manufactures from oil? From ores? 38. What about manufactures from clay and limestone? 39. What conditions favor the transportation of goods? 40. Name and locate the principal cities along the Great Lakes. 41. State the chief facts about Duluth and Superior. 42. Outline the history of the region about Chicago. State the advantages of the site of the city. 43. Give an account of meat packing and related industries there. 44. What other kinds of manufacturing are prominent in Chicago? 45. What means of transportation are provided in the city? 46. How is the sewage taken care of? 47. What about education in this vicinity? 48. What can you tell about Milwaukee and Racine? 49. Detroit and Ann Arbor? 50. Cleveland and Toledo? 51. Name and locate the principal cities along the great rivers. 52. For what is St. Louis especially important? 53. St. Paul and Minneapolis? 54. Name smaller cities on the Mississippi River and tell of their importance. 55. Locate and tell what you can about the various cities along and near the Missouri River. 56. State the principal facts about the cities in the Ohio Valley.

Review Questions by States

Ohio (O.). 1. Name the four largest cities (Appendix, pp. 427–428). State the advantages of each location. 2. What other cities of Ohio are mentioned? For what is each important? 3. Why is there much manufacturing in this state? 4. What other industries are mentioned in the text? 5. Examine the maps (Figs. 249–259) in order to see what crops are especially important in Ohio. 6. In what ways are the cities of Ohio dependent upon New Orleans and New York? How are the latter cities dependent upon those in Ohio? 7. Of what service to Cleveland and Toledo is the Erie Canal? 8. Draw a sketch map of Ohio like that of Maine (p. 47). As you study each state, do the same.

Indiana (Ind.). 9. Examine the maps (Figs. 249–259), to see what crops are produced in Indiana. 10. What minerals are found here? 11. Which is the largest city? For what noted? 12. What other cities are mentioned? 13. What are the industries of Indiana? 14. Of what importance was the fact that a large part of this section was treeless when discovered?

Kentucky (Ky.). 15. Why should this state be better adapted to tobacco raising than Ohio? 16. Of what importance is the limestone of Kentucky? 17. Where are most of the cities? Why there? 18. What products are mentioned from Kentucky? 19. Which is the largest city? For what important? 20. What other cities are mentioned?

Illinois (Ill.). 21. Examine the maps (Figs. 249–259) to see what crops are especially important. 22. Why is there much manufacturing in Illinois? What kinds are carried on? 23. Of what value is the lake to manufacturing? 24. State the reasons why Chicago has developed so greatly. 25. What other cities are mentioned in this state? For what is each important? 26. Which of the four states so far reviewed is the largest? Which smallest (Appendix, pp. 425–426)?

Michigan (Mich.). 27. What lakes does this state border? Of what advantage is this? 28. What disadvantage can you see in the fact that water separates the lower from the upper peninsula of Michigan? 29. Ice stops canal traffic in winter. What effect must this have? 30. Into what waters does this state drain? Contrast this drainage with that of the other states. 31. Where are most of the large cities? Why there? 32. For what is each important? 33. Give the reasons for the location of Detroit? 34. What are the important products of Michigan?

Wisconsin (Wis.). 35. Which is the largest city in this state? For what important? 36. What other cities are mentioned in the text? What is done in each? 37. Compare Wisconsin with Michigan in relief; in mineral products; in crops; in the size of cities. 38. What effect must the lakes have upon the climate? Would this influence be greater or less than in Michigan? Why? 39. If there were coal beds in northern Wisconsin, what effect might the coal have upon Chicago, Cleveland, and the coal mining of Pennsylvania?

Minnesota (Minn.). 40. Where does the Mississippi River rise? 41. What oceans receive the waters that fall upon Minnesota? Give proof. 42. What manufacturing industries are carried on in this state? 43. What crops are raised? 44. Name the three largest cities, and tell how each is important. 45. How does the largest compare in size with Boston? With Cincinnati?

Iowa (Ia.). 46. Examine the maps (Figs. 249–259) to see what crops are raised in this state. 47. What other important industries are carried on? 48. Name the largest cities. For what are they noted? 49. Much corn is raised here; what is done with it?

Missouri (Mo.). 50. Examine Figures 249–259 to see how the crops of Missouri differ from those of Minnesota. Why this difference? 51. Why are so few large towns found in the southwestern part? 52. Name and locate the two largest cities. For what is each important? 53. What other cities are mentioned? 54. Find the population of St. Louis; compare it with that of Philadelphia and Boston. 55. Give five reasons for its great size.

Kansas (Kan.). 56. Why are the cities in the eastern part? 57. What are the industries of the West? Why? 58. What are the leading crops in Kansas (Figs. 249–259)? What other industries are important? 59. Name the principal cities. For what is each noted?

Nebraska (Neb.). 60. How do the industries of Nebraska compare with those of Kansas? Why? 61. How are these states alike in regard to location of cities? 62. What cities in Nebraska are mentioned? 63. For what is Omaha noted?

North and *South Dakota* (N.D. and S.D.). 64. These two states once formed the territory of Dakota. Suggest reasons for making two states out of the one territory. 65. Compare the industries of the two states with those of Nebraska and Kansas. 66. Look at the corn and wheat maps (Figs. 249 and 251) to see where most wheat and corn are produced. Is North Dakota more or less important than Kansas as a corn-producing state? Answer the same for wheat. Why is this so? 67. Of what advantage would it be to Fargo if a deep river extended from that city to Duluth? 68. How do the Black Hills increase the wealth of South Dakota?

General Review Questions

69. Which state is the largest in this group (Appendix, pp. 425–426)? Which smallest? Compare each of these in area with Pennsylvania; with Texas. 70. Which of the Central States has most inhabitants (Appendix, p. 425)? Which fewest? Compare each of these in population with New York; with Texas. 71. Find the largest ten cities (Appendix, p. 426).

Suggestions

1. Find how much earlier in the fall frosts come in Minneapolis than in Memphis. 2. How do farms that you have seen differ from the Ohio farm described in the text? 3. How does the wind often help ranch cattle to obtain food in winter? 4. What are some of the adventures that cowboys experience? 5. Why are coal and brick especially valuable in a prairie country? 6. Visit a brickyard, and write a description of brickmaking. 7. See how long a list you can make of articles manufactured partly or wholly out of copper. 8. Do the same with regard to lead. 9. How are the advantages of the location of Chicago somewhat similar to those of Atlanta? 10. Make a drawing of the great water route from Duluth to New York City, and put in the leading cities located upon it. What states border on this route? 11. Make a drawing of the Mississippi, Missouri, and Ohio rivers, and include the leading cities. What states do these rivers border or cross? 12. Make a sketch map of the Central States, including the principal lakes, rivers, and cities.

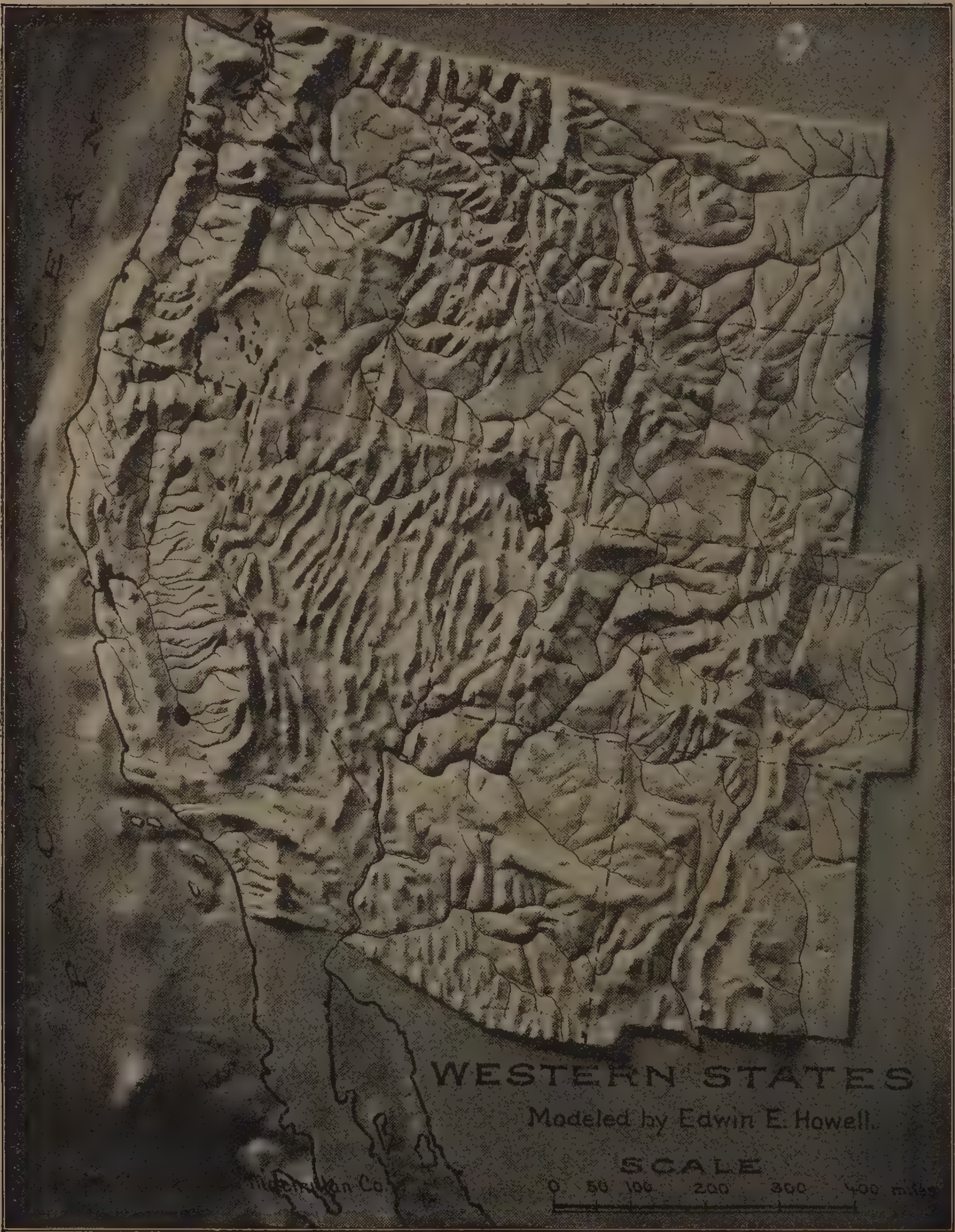


Fig. 161. — Relief map of the Western States.

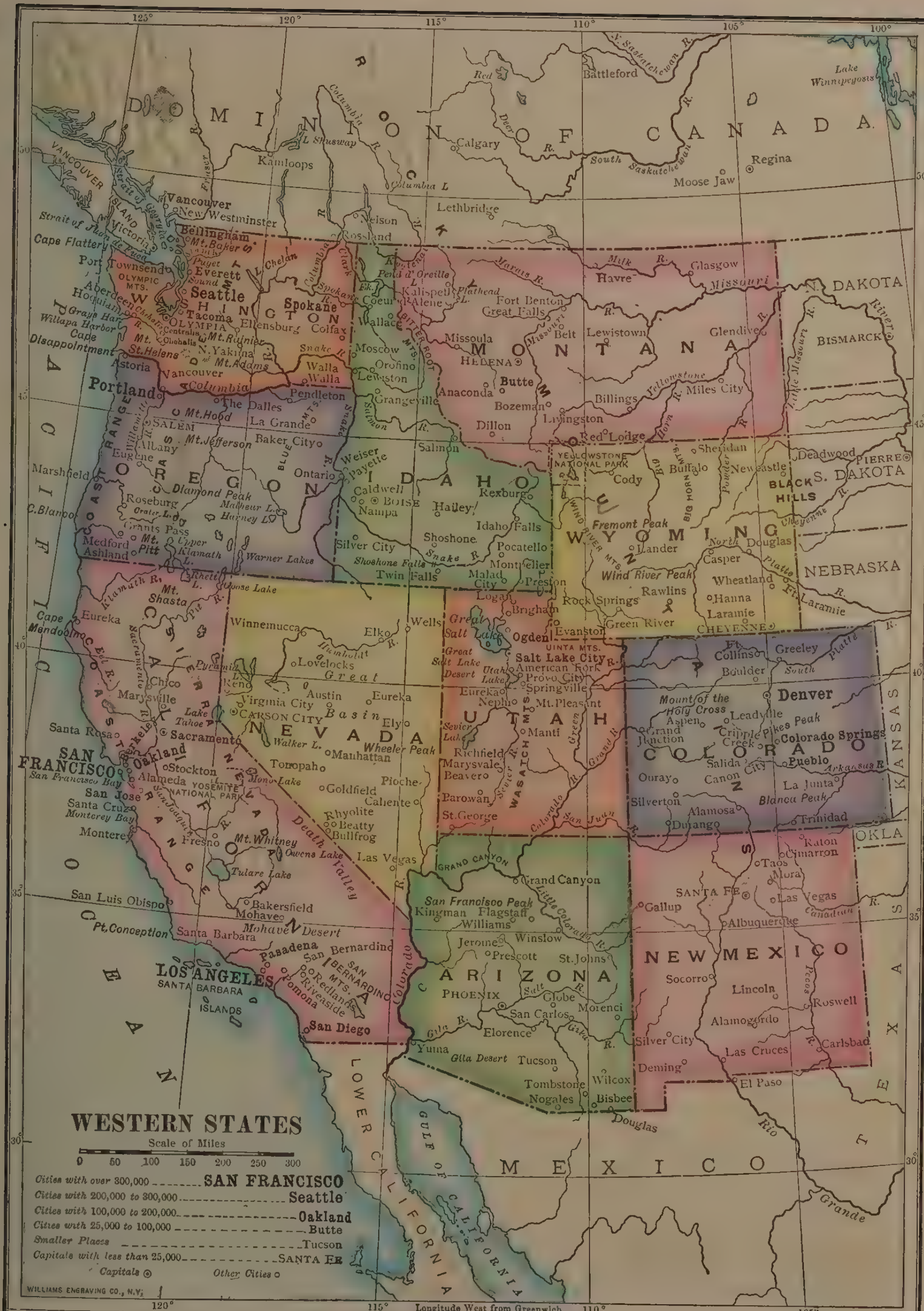

WESTERN STATES
Scale of Miles
0 50 100 150 200 250 300
Cities with over 300,000 SAN FRANCISCO
Cities with 200,000 to 300,000 Seattle
Cities with 100,000 to 200,000 Oakland
Cities with 25,000 to 100,000 Butte
Smaller Places Tucson
Capitals with less than 25,000 SANTA FE
Capitals ◎ Other Cities ○
WILLIAMS ENGRAVING CO., N.Y.
Longitude West from Greenwich
125° 120° 115° 110° 105° 100°
50 45 40 35 30
DOMINION OF CANADA
ROCKY MTS.
PACIFIC OCEAN
MEXICO
LOWER CALIFORNIA
GULF OF CALIFORNIA
WASHINGTON
OREGON
CALIFORNIA
NEVADA
IDAHO
MONTANA
WYOMING
UTAH
COLORADO
ARIZONA
NEW MEXICO
N. DAKOTA
S. DAKOTA
NEBRASKA
KANSAS
OKLA
TEXAS
VANCOUVER ISLAND
Strait of Juan de Fuca
Cape Flattery
Vancouver
New Westminster
Victoria
Bellingham
Mt. Baker
Everett
Seattle
Tacoma
OLYMPIA
Spokane
Walla Walla
Portland
SALEM
Mt. Hood
Klamath L.
Mt. Shasta
Sacramento
SAN FRANCISCO
Oakland
San Jose
Stockton
Fresno
Mt. Whitney
YOSEMITE NATIONAL PARK
SIERRA NEVADA
Death Valley
Bakersfield
LOS ANGELES
San Diego
SANTA BARBARA ISLANDS
Pt. Conception
Mohave Desert
CARSON CITY
Reno
Great Basin
Goldfield
Tonopah
Las Vegas
BOISE
Snake R.
Pocatello
Twin Falls
HELENA
Butte
Great Falls
Missouri R.
Yellowstone R.
YELLOWSTONE NATIONAL PARK
Cheyenne
Laramie
Great Salt Lake
Salt Lake City
Ogden
WASATCH MTS.
UINTA MTS.
Denver
Pueblo
Colorado Springs
Pikes Peak
Leadville
GRAND CANYON
Grand Canyon
Flagstaff
PHOENIX
Tucson
Yuma
Gila R.
Colorado R.
SANTA FE
Albuquerque
El Paso
Rio Grande
Pecos R.
Calgary
Regina
Moose Jaw
Lethbridge
Battleford
BISMARCK
PIERRE
BLACK HILLS
Lake Winnipegosis

FIG. 160.

6. Western States

Map Study 1. Compare this group with each of the other groups in relief (Fig. 42); in area, and in population (Appendix, pp. 425–426)? 2. Which is the largest state? Which the smallest? How does each of these compare in size with Pennsylvania? With Texas? 3. What becomes of the water of the Humboldt River? 4. Name the five largest rivers. Where does each rise, through what states does it flow, and where does it empty? 5. Name the principal mountain ranges; the plateaus (Fig. 42). 6. Where are the largest cities? Why there? 7. Find the Yosemite and Yellowstone parks. 8. Name the states having a seacoast. 9. Name those states whose waters drain mainly or entirely into the Pacific; into the Atlantic; into the Great Basin.

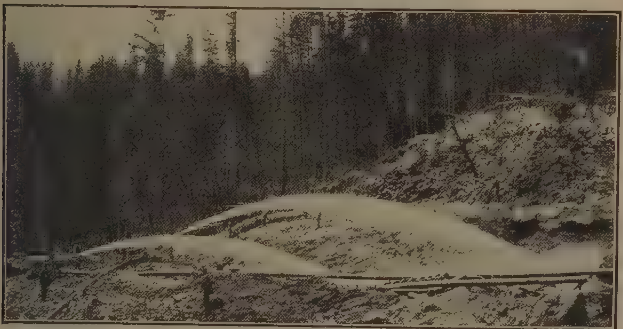


FIG. 162.—These powerful streams of water wash the gravel away, and the gold collects in the bottom of troughs or sluices. This is called hydraulic mining.

Early history While the pioneers were settling the prairies of the Central States, almost nothing was known about the Far West. The Spanish had taken possession of the southern portion, and many of their names, such as New Mexico, Los Angeles, and San Francisco are still to be found there. The northern portion, called Oregon, was claimed by English-speaking people, and there was a great immigration to the Willamette valley in 1843.

1. Discovery of gold in California In 1848 gold was discovered in the stream gravels of California. For ages the precious metal had lain scattered through the rocks of the Sierra Nevada Mountains. Then, as the mountains slowly crumbled, it had been washed into the streams. Being very heavy, it dragged along at the bottom, lodging here and there in the stream beds. It was such gold as this that was first found.

2. Effect of the discovery As the discovery became known, tens of thousands of persons in the East left farms, factories, and homes in a mad rush for the gold fields. Some sailed all the way around South America; others crossed the Isthmus of Panama; but many traveled overland, running the risk of attack from Indians and of death from thirst. There were then no railways west of the Mississippi, and the journey was long, tedious, and dangerous.

The discovery of gold quickly drew so many persons to California that the territory was able to enter the Union as a state in 1850; and, as the search for the precious metal was carried farther and farther, the entire West soon became explored and settled. Railways were built across the mountains (Fig. 280), and many industries, such as farming, lumbering, and manufacturing, have followed mining. Indeed, in many sections these industries are now much more important than the mining.

Surface of the country

1. The three principal mountain systems The Western States are made up almost entirely of plateaus and mountains. Most of the surface is more than a mile above sea level, while some mountain peaks are two miles or more in height.

The extreme eastern portion is a part of the Great Plains (p. 5), which reach to the very base of the *Rocky Mountains.* These mountains (Fig. 42) extend entirely across our country, into Mexico on the south, and Canada on the north. They consist of a large number of ranges and ridges, which reach their greatest height in Colorado. A long distance farther west, and almost parallel with the Rockies, is another system of mountains, called the *Sierra Nevada* in California and the *Cascade Ranges* in Oregon and Washington. Still farther west, and close to the coast, is a third system known as the *Coast Ranges*, some portions of which rise directly out of the ocean. The highest peak in these mountains is Mount Whitney, in California, the loftiest mountain in the United States proper.

2. The valleys between

Between the Rocky Mountains and the Sierra Nevada-Cascade ranges, is a broad valley dotted with numerous short mountain ridges, extending north and south. There is a plateau at each end, and a broad basin of interior drainage between, in which there are a number of salt lakes. It may be divided into three parts (Fig. 42): (1) The great *Columbia Plateau* of Idaho, Oregon, and Washington, on the north; (2) the *Colorado Plateau* of Arizona and Utah, on the south; and (3) the *Great Basin* of Utah and Nevada between the two. The numerous short mountain ranges in the Great Basin are called the *Basin Ranges.*

Between the Sierra Nevada-Cascade system and the Coast Ranges there is an area of lowland (Fig. 41). In California, Oregon, and Washington this forms a fertile valley; in Washington it is partly occupied by Puget Sound.

3. The volcanoes, and their influence

Throughout much of this Western country volcanoes were once very active (p. 4). Indeed, some of the loftiest peaks are extinct volcanoes. Among these are Mount Rainier (also called Mount Tacoma) (Fig. 163), within sight of TACOMA and SEATTLE, Wash.; Mount Hood, not far from PORTLAND, Ore.; and Mount Shasta, in northern California. Other fine volcanic cones in this region are Mount Baker, Mount Adams, and Mount St. Helens.

Lava covers hundreds of thousands of square miles in these Western States, and its decay has produced a soil which is very fertile. The lava has also had an important effect upon the deposit of valuable minerals. Veins of gold and silver usually occupy cracks in the rock, caused by the breaking of the rock layers while the mountains were forming. Through these cracks water passes, often heated so hot by the buried lava that it is able to dissolve mineral matter and carry it along. As the water cools, on nearing the surface, it cannot hold all of this mineral in solution, and therefore deposits a part of it on the walls of the cracks. In this way many valuable veins of metal have been slowly formed, and it is for those that thousands of miners are now searching. Hot water still flows from the earth in many parts of the West, the section most noted for this being the Yellowstone Park. In this water there is much mineral matter in solution, and in some cases even small quantities of gold.

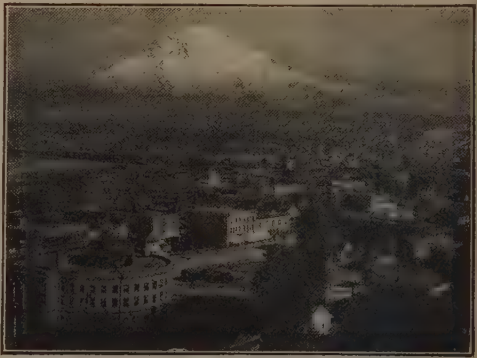


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FIG. 163.—Mount Rainier from Tacoma. This beautiful, snow-capped peak is 60 miles away.

The climate

1. Extent of arid lands

In the East, there is little variety in the climate, even over large sections; but in the West the variety is great. Even in a single state there are often great differences. Nearly everywhere, excepting in the Northwest and on the mountain slopes and plateaus, it is so dry that no agriculture is possible without irrigation. Almost one fifth of the United States is unfit for agriculture without irrigation, and most of this arid land is in these Western States.

Parts of southern California, Nevada, Utah, and Arizona, and smaller portions of each of the other states, are true desert. Near the western shores of Great Salt Lake, for example, not a tree nor even a shrub is to be seen for miles and miles (Fig. 164). The entire surface is covered by a glistening whitish substance called *alkali*. In other regions dreary wastes extend for hundreds of miles, broken only by a few cacti and other arid land plants, by rocky ledges, and by occasional mountain peaks.

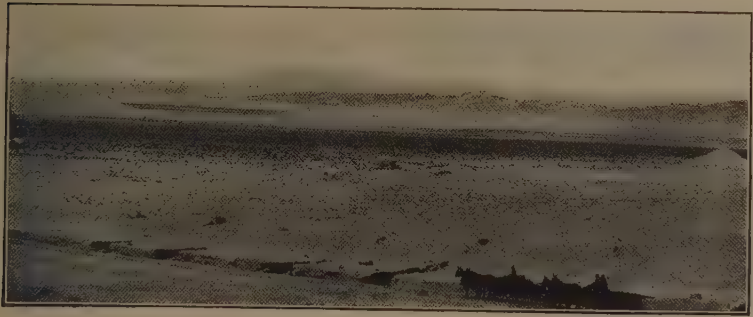


FIG. 164. — The desert near Great Salt Lake in Utah.

The scarcity of streams on the map in and near Nevada shows clearly the lack of water there. That section is a real basin, having a rim higher than the center, and for that reason it is called the *Great Basin* (Fig. 42). Some of the few streams flow into shallow salt lakes, which are growing more and more salt as the years pass; others dry up and disappear in the sand.

2. The well-watered sections

(1) *The northwestern coast*

Along the northwestern coast the damp west winds from the ocean bring so much vapor that the rainfall is heavy. Indeed, along the coast of Washington the rainfall is heavier than in any other part of the United States (Fig. 303), the greatest amount falling in winter. There is also plenty of rain in western Oregon and the northern half of California.

Being robbed of its vapor in crossing the mountains, the air descends on the eastern side quite dry; and there agriculture without irrigation is possible in only a few sections, as in the high mountain valleys and in the wheat district of central and eastern Washington and Oregon.

(2) *The higher plateaus, and the mountains*

Throughout the West the higher mountains and plateaus receive enough rain for crops. That this is true is proved by the numerous large rivers which have their sources there. Name and locate those flowing from the Rocky Mountains into the Mississippi. Trace the Rio Grande and its principal tributary, the Pecos; also the rivers that empty into the Pacific Ocean. Although long, many of these rivers are shallow, and during the summer season some, like the Rio Grande, almost disappear in the middle part of their course. Others, like the Columbia and Sacramento, are navigable in parts of their course.

The importance of the higher plateaus in condensing vapor is well shown by the highlands of central Arizona. A person traveling eastward from Los Angeles, on the Atchison, Topeka, and Santa Fé Railway, finds himself, upon reaching the Colorado River in the evening, in the midst of a desert about five hundred feet above sea level. If it is summer, the thermometer may register from 110° to 120° in the shade, for this is the hottest region in the United States; indeed, it is even hotter than many parts of the torrid zone.

After leaving the river, the train slowly winds its way up onto the Colorado plateau, seven thousand feet high, and the next morning the almost unbearable heat of the previous day is replaced by a delightfully cool air. As if by magic the scene is changed; the barren wastes of sand are gone, and a green forest is on all sides. This change is due to the simple fact that the air is cooler on the high plateau, and the vapor can therefore be condensed into rain, while there is less evaporation of the water in the soil.

(3) *The oases*

Finally, in the desert itself are many oases where water for irrigation is at hand. By aid of water, even the most barren land may be transformed to a beautiful garden (Fig. 165).

Mining

1. Kinds of minerals, and ownership of mining lands

Every one of the Western States contains mineral deposits of some kind, such as gold, silver, copper, lead, mercury, petroleum, and coal. This region is now one of the most important mining districts in the world.

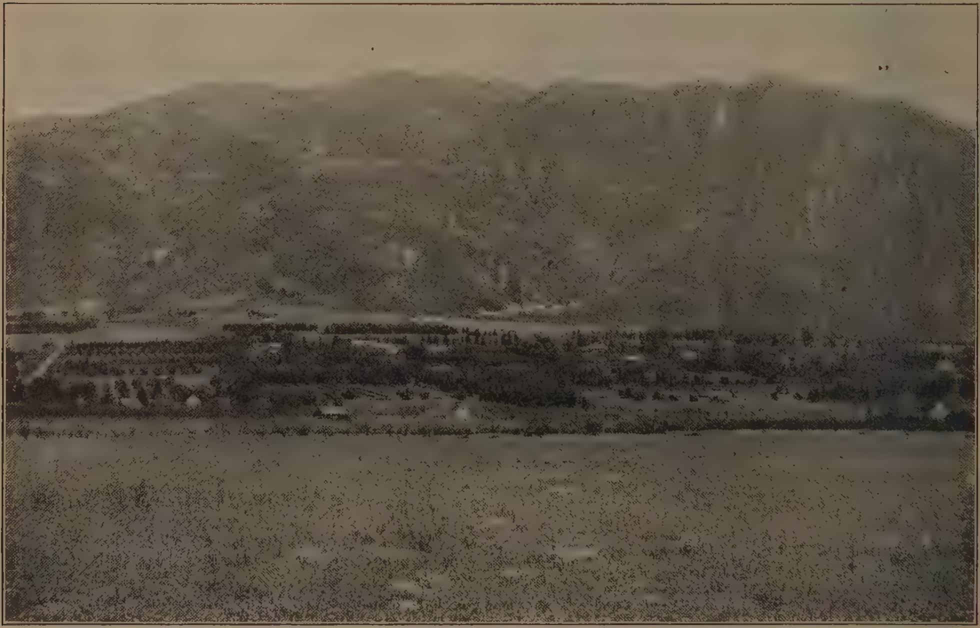


FIG. 165. — This view, near Pasadena, California, shows the barren arid lands, in the midst of which are extensive orange groves, irrigated by water from the mountains.

Much of the land is still owned by the government, and all ore that is discovered upon it belongs to the finder. Any citizen of the United States may become the owner of a valuable mine, if he can find one on government land. With such a hope, hundreds of prospectors are digging tunnels into the earth wherever they believe they may obtain ore. In most cases they are doomed to disappointment; but they keep trying, moving from one place to another, always hoping for a rich reward. Sometimes valuable ore is found, and then a poor prospector suddenly finds himself a rich man.

2. Methods of mining gold

Much gold has been discovered in the river gravels. In many regions it is easy to get the gold out of these gravels, but in some places these ancient stream beds have been covered with a thick layer of hard lava. Then it is necessary for the miners to tunnel under the lava in order to obtain the gold.

(1) *"Panning" the gold*

The first miners obtained the gold in a very simple manner. Placing some of the stream gravel in a pan of water, they rocked it back and forth in such a way as to cause the heavier particles of gold to sink to the bottom of the pan, while the lighter minerals on top were washed out and thrown away. Most of the gold was in very small flakes, but sometimes the miners found large lumps of gold, called *nuggets*, worth hundreds of dollars. This method of washing away the gravel in pans was called "panning" the gold.

(2) *Hydraulic mining*

Very soon the miners tired of such a slow process. They then invented the far more speedy plan of *hydraulic mining*. By this method a large, powerful stream of water, from the nozzle of a pipe, is turned against a gravel bank, washing the gravel rapidly away (Fig. 162). The water, with the gravel and gold, then runs into steeply sloping troughs, or *sluices*, the bottoms of which are made rough by many cleats. The rushing water carries the gravel over these cleats to the end of the sluice, where it is dropped; but the gold, being so heavy, settles to the bottom of the sluice and is caught behind the blocks. Later it is removed and carried away to be sold.

In this way much gold has been obtained from the gravels of California and other Western States. For example, even the gravel out of which some of the streets of HELENA, Mont., are built has been washed for gold in this way.

(3) *The common method now*

The method by which most gold is now obtained, is to dig into the solid rock, as in the case of other metals. The shafts and tunnels follow the veins from which the gold in the gravels came. In the veins, the metal is found mixed with other minerals which are of little or no value. This mixture forms gold ore, and there is so little gold in such ore, and it is in such small grains, that one may spend days in a mine looking for it without *seeing* any. The gold ore, like other ores already studied, must be crushed and melted before the gold itself can be obtained.

3. Noted mining districts

(1) *In Nevada*

One of the most remarkable gold-mining districts in the world is that of the Comstock Lode at VIRGINIA CITY, Nev. The vein is irregular in richness, some parts, called "bonanzas," containing much gold and silver, while elsewhere it is quite barren. So much metal has been obtained from this single vein that Nevada at one time produced more silver than all the other states put together, and more gold than any other state in the Union. So many people moved there then that Nevada territory became a state in 1864; and Virginia City, though in the midst of a desert, grew to be a thriving city.

As the mines went deeper, hot water, with a temperature of 170°, poured in and caused the temperature in the mines to be almost unbearable. Ice-cold air was forced in, and machinery and mules were made to do most of the work; but even then men fainted at their posts. Partly because of the difficulty of mining, and partly because of the failure to discover new bonanzas, some of the mines were abandoned and people drifted away, so that for a while the population of Nevada decreased.

With the discovery of many rich new mining fields, and the re-opening of old mines, new towns have sprung up, and Nevada is again the center of great mining activity and one of our most important mining states. It is one of the leading states in the production of gold and silver. TONOPAH, GOLDFIELD, and BULLFROG are important and rapidly growing mining towns. These and other cities are now more important than Virginia City.

(2) *In Colorado*

At present Colorado produces more gold than any other state (Fig. 272), and it ranks fourth in the production of silver. In addition to these metals, Colorado produces much copper, lead, and iron. Among the mountains, one sees many mines (Fig. 166); but one of the most noted mining districts is near LEADVILLE, a city at an elevation of over ten thousand feet above the sea. Gold, silver, and lead are mined in this locality.

Another well-known mining camp in Colorado is CRIPPLE CREEK. A few years ago there was no town here, and the gold ore, which later proved so valuable, was not recognized as ore by the prospectors. Finally, when some one discovered the gold, thousands of people rushed in from all directions, and a city sprang up almost in a day. This has been true in many other places. Sometimes the cities have continued to grow, but if the mines have given out, the mining centers have been abandoned almost as rapidly as they grew.

Iron is found in several of the Western States, but as yet it is not mined to a great extent except west of PUEBLO, in Colorado.

(3) *In Montana*

The western half of Montana is another noted mining section, and this state is now second in the production of silver and copper, while it also supplies much lead, gold, coal, and other mineral products, including precious stones. HELENA has already been mentioned

(p. 123), but no portion of the state is now so important for mining as the region in and near BUTTE (Fig. 182). There the principal metal is copper, although some gold and silver are mixed with the ore. More copper has been produced at the Butte mines than in any other mining district in the world. The mines are very extensive, reaching several thousand feet into the earth, and having tunnels through which one might wander for days without finding his way out.

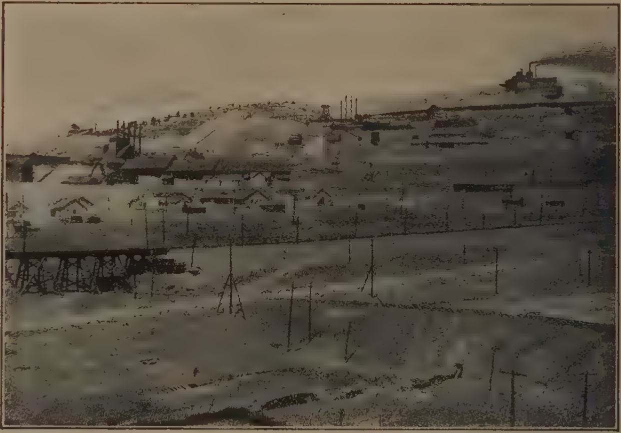


FIG. 166. — A view in the mining district of Victor, Colorado. There are mines beneath these buildings, and the waste rock removed from the tunnels form huge banks near them.

(4) *In other Western States*

The mining industry of Arizona is also very important, much copper, silver, lead, and gold being produced. Arizona now ranks first among the states of the Union in the production of copper. One of the largest cities in the territory is TUCSON (Fig. 167). Another large city is BISBEE, the center of a noted copper mining region and rivaling Butte, Montana. There is much smelting at DOUGLAS, and all these cities, as well as PHŒNIX, are trade centers for neighboring mines and irrigated farms.

There is much mining, especially of gold, silver, copper, and lead, in each of the other Western States. California ranks second among our states in the production of gold, Utah third in silver and lead, and Idaho second in lead and fifth in silver. The Cœur d'Alene mining district of northern Idaho is the most important silver-lead district in the country. SPOKANE, in Washington, is the trade center for this noted mining region, which has had much to do with the remarkable and recent growth of this city. In addition to the metals mentioned, these states, as well as Wyoming and New Mexico, produce

FIG. 167. — Tucson, Arizona, which owes much of its prosperity to the rich mines in the neighboring mountains.

large quantities of other valuable minerals. There are many important mining towns and mining camps in each of these states.

4. Coal, petroleum, and other minerals

Coal, some of it of excellent quality, occurs in many sections of the West, being mined in almost all these states. Colorado produces more than any other Western state, ranking seventh among the states of the country in this production. But other Western States produce considerable amounts: among these Wyoming and Washington are next in importance to Colorado. Nearly every one of the Western States has coal beds which are bound to be of great value in the future.

Petroleum is another valuable product in the West. Enormous quantities have been found in California, and that state now produces more than any other in the Union. So much is produced, in fact, that it is used on railway engines, in place of coal.

There are many other mineral products in the Western States, including building stones and semi-precious stones, which are obtained in California, Arizona, Colorado, Utah, Nevada, and other states.

Lumbering

1. The special demand for lumber

Mining gives rise to much lumbering in many parts of the West. The Butte mines alone consume millions of feet of lumber per year. In the mines heavy, upright timbers are placed together, on each side of a tunnel, to prevent the rock from caving in. Because of the great pressure upon them, timbers more than a foot through are often broken.

2. Where it is obtained; also kinds of trees

While a great portion of the Western country is arid, the mountains and some of the higher plateaus bear extensive forests. Thus the mines, which are usually among the high mountains, are generally supplied with little difficulty; for the logs are easily brought down to them.

The most noted lumber region, however, is on and near the western coast from central California northward. Here, in the damp, equable climate, the giant redwood, fir, cedar, and spruce trees grow to great size, the redwood being confined to California, where there are extensive forests of these *big trees* (Fig. 198). There are immense forests of giant trees all the way from central California to Canada. While the logs in Maine and Michigan are rarely more than two or three feet through, many in Washington and Oregon are from six to fifteen feet in diameter, and some in California are very much larger.

3. Method of lumbering

A visit to a lumbering camp in western Washington will show that, owing to the size of the trees, and to the climate, the work is carried on very differently from lumbering in Maine (p. 33). The men are able to work both winter and summer. They select a tree, which perhaps towers upward for two hundred feet, that is, higher than most church steeples. Two men saw and chop at this tree until the giant begins to quiver, and when finally it falls, a wonderful sight may be seen. The tree bends slowly over, quickens its movement, then falls to the ground with a mighty crash, breaking good-sized trees in its way, as if they were twigs.

After the branches are cut off, the tree is sawed into sections of different lengths (Fig. 168), as twenty-four, thirty-two, or forty-eight feet, and these are dragged to a railway which leads up into the forest. There the logs are piled upon flat cars and taken to the mills, a single section sometimes occupying an entire car (Fig. 169). From five to fifteen thousand feet of lumber, or enough to build a small house, may be obtained from a single large tree (Fig. 170).

4. What is done with the logs and lumber

Many of the logs go to TACOMA and SEATTLE, where there are enormous sawmills. There is such an abundance of wood that in some places thick planks are used for paving the streets; and wood is burned as a fuel in locomotives, and in the lumber mills. Such enormous quantities of lumber are obtained from these forests, and so cheaply, that it is sent even as far as the Atlantic coast. The Northwest is now one of the greatest lumbering regions in the country, and all the cities there have some share in the industry. Much lumber is sent away by boat from PORTLAND and ASTORIA, but even more goes from the cities of Puget Sound. Besides TACOMA and SEATTLE, EVERETT and BELLINGHAM are noted for their lumber industry. With so much lumber it is natural that there should be extensive manufacture of shingles, doors, and other wooden articles.

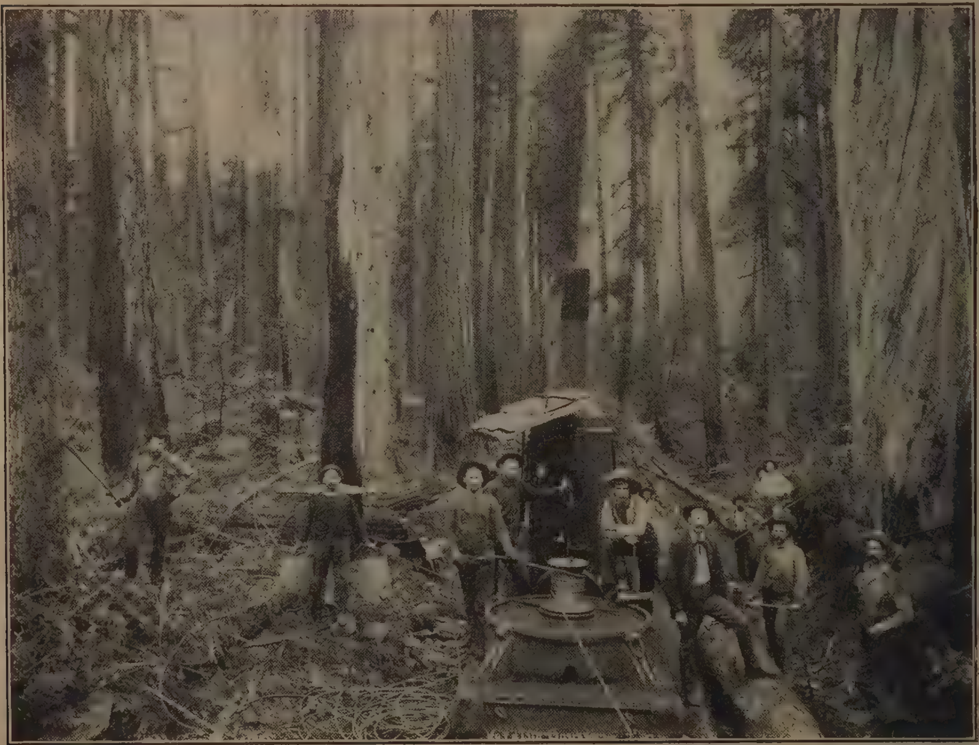


FIG. 168. — Lumbermen at work in the forest of Western Washington. Note in the foreground the donkey engine used for drawing logs.

5. Forest reservations

A great deal of the forest of the West is on government land, and to prevent it from being wasted, our government has set apart what are called *forest reserves* (Fig. 265). That is, the forest is kept, or *reserved*, by the government, so that no one can cut down the trees without permission. In this way a supply of timber will be preserved for use in the future; for it is hardly fair that we should leave no timber for those who come after us. In addition, the forests are of value in preventing the rapid running off of the water in streams; thus they help to regulate the supply of water for manufacturing, irrigation, and other purposes.

Fishing

Although there are few fishing banks along the western coast of the United States, there are some on which valuable food fish are found. Other kinds of fish are caught along the coast, or are found swimming in the surface waters; and the oyster thrives in the shallow waters at the head of Puget Sound.

Large numbers of cod and halibut are

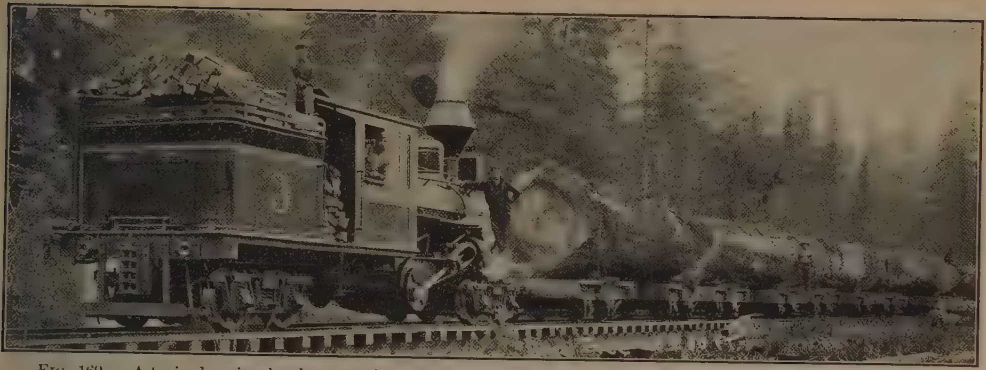


FIG. 169. — A train drawing lumber out of the forest of western Washington. Each section of a log occupies an entire car, and all the logs in the picture are parts of a single tree.

caught on the banks and along the shores of British Columbia and Alaska, and many vessels go there, especially from Seattle. Not all the fish that are caught are eaten by the Western people; some are shipped to other parts of the country, even to Eastern cities. Fresh halibut, kept on ice in refrigerator cars, are sent from Seattle to many places in the East.

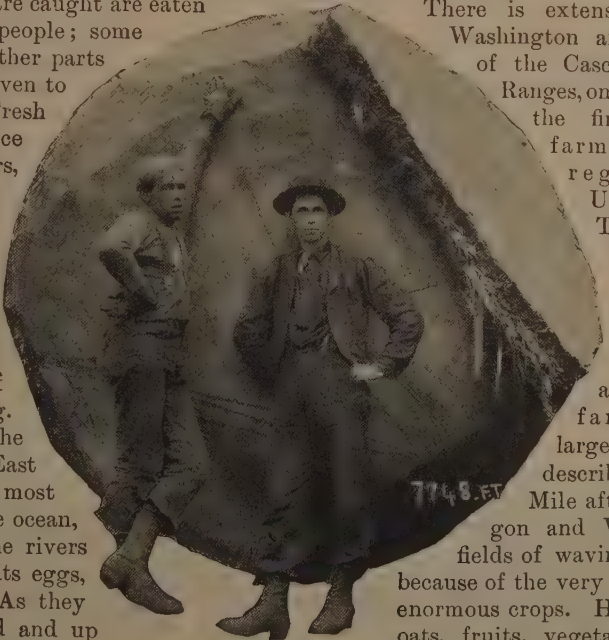


FIG. 170. — The end of a log cut from the forest of western Washington. You can see how large it is by the men standing in front of it.

The most important fishing industry, however, is that of salmon catching. This fish, like the shad of the East (p. 51), spends most of its life in the ocean, but passes up the rivers to spawn, or lay its eggs, in fresh water. As they are going toward and up the rivers, the salmon are caught in great numbers, and some are shipped away in ice, even across the continent. Others are sent to the numerous canning factories at ASTORIA and other points along the lower Columbia, and to BELLINGHAM and other points on Puget Sound, where they are packed in cans (Fig. 171).

Agriculture
1. In the Northwest and California

There is extensive farming in Washington and Oregon, east of the Cascade Ranges, one of the finest farming regions in the United States. This is a noted wheat country (Fig. 172), like the valley of the Red River of the North, and some of the farms are even larger than the one described on page 97. Mile after mile, in Oregon and Washington, are fields of waving grain, which, because of the very fertile soil, yield enormous crops. Hay, barley, corn, oats, fruits, vegetables, and farm animals are also raised. During the harvest season the air in most sections is so dry that both grain and hay may be left out of doors for weeks with little danger of being spoiled by rain. WALLA WALLA, Wash-

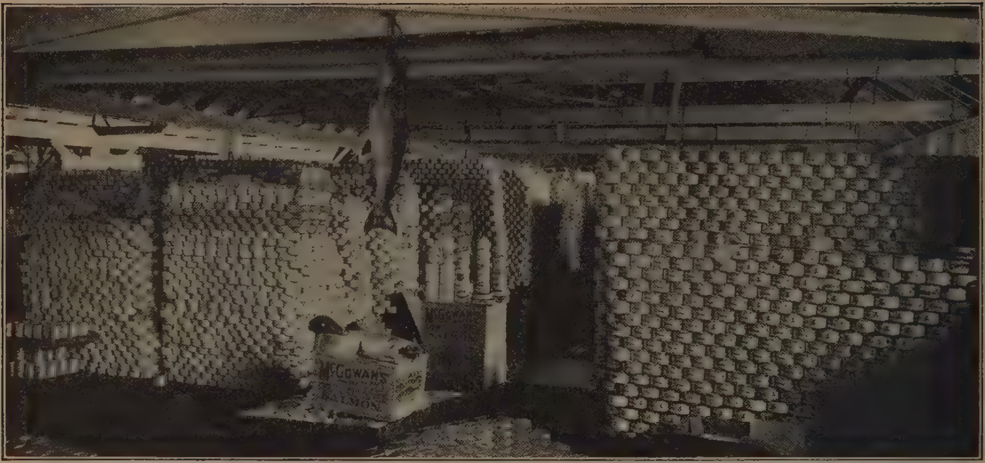


FIG. 171. — Interior of a salmon cannery on the Columbia River. A salmon hangs from the roof; and there are thousands of cans of salmon piled up on the floor.

ington, LEWISTON, Idaho, and PENDLETON, Oregon, are situated in this great wheat region.

Near the eastern base of the Cascade Ranges the climate is so dry that irrigation is necessary and there, as in the Yakima Valley, is found a wonderful fruit country. On the western side of the Cascade Ranges there is abundant rainfall and there fruit, vegetables, and grains, as well as hops, are extensively produced. The entire Pacific coast region, from Canada to Mexico, is famous for its excellent fruit. In the north berries, apples, pears, plums, cherries, grapes, and other fruits are produced; but in the south, in the *Great Valley of California* (p. 120), besides these fruits there are groves of oranges, lemons, olives, and figs, as well as other trees which thrive only in warm climates. SACRAMENTO, STOCKTON, and FRESNO are the leading cities of the Great Valley, which, throughout its whole length, is occupied by a succession of wheatfields, vineyards, orchards, and nut and fruit

FIG. 172. — Cutting wheat in the fertile farming district of central Washington. By these machines the wheat is cut, threshed, and sacked all ready for shipping.

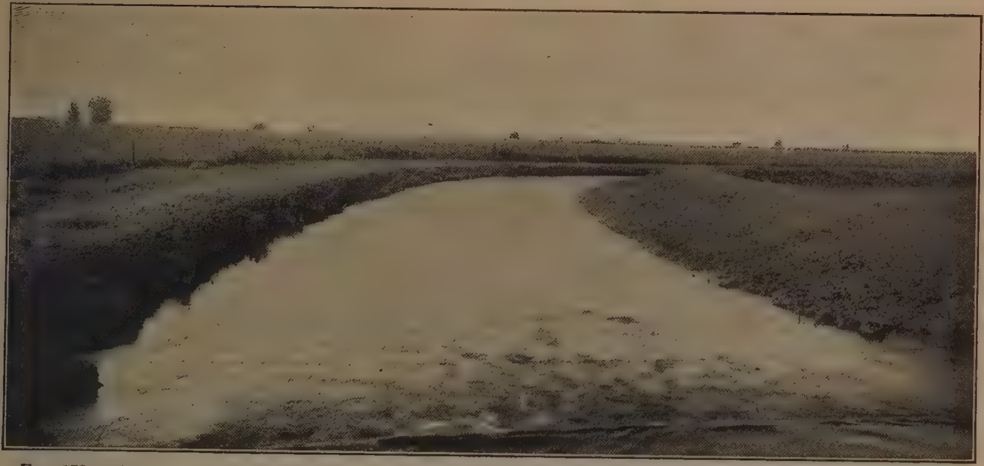


FIG. 173. — An irrigating ditch near Denver. The water is led from a river, and by it the land, otherwise useless for agriculture, is made to yield rich harvests.

groves; but in the central and southern portions, where the rainfall is light, irrigation is provided as described in a later section. California fresh fruit is shipped in enormous quantities to Eastern cities, while dried and canned California fruits are to be found in most of our grocery stores.

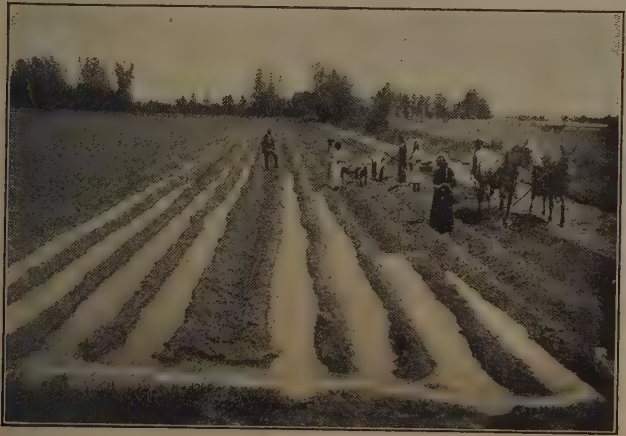


FIG. 174. — A farmer irrigating his field. The water from the irrigating ditch is allowed to run along the furrows and thus wet the seeds that have just been planted.

There are a few other, smaller sections where the rainfall is sufficient for agriculture; but the only way in which farming is possible in most other parts of the West is by means of irrigation.

2. In Colorado and Wyoming, by irrigation

(1) *How irrigation is planned near Denver*

The influence of irrigation is well illustrated in the region near DENVER, which lies in the midst of an arid plain. This plain is crossed, however, by the South Fork of the Platte River, from which a ditch, as large as a canal, is led out upon the plain (Fig. 173). The river itself has a rapid fall, but just enough slope has been given the ditch to allow the water to flow. Thus the ditch soon runs on a higher level than the river, and the land between it and the river is lower than the ditch.

Water from the ditch may then be led out over these fields to irrigate them. For this purpose ditches branch off from the main canal, and each of these is divided and subdivided to supply farms along its course. When a field needs water, one of the smaller ditches is tapped and the field is flooded; or else the water is led into little furrows a few feet apart (Fig. 174). The method followed depends upon the kind of crop that is under cultivation. As there is danger that the supply of water may not last through the summer, reservoirs are built to store the water of the spring freshets; and when needed, this is allowed to flow into the ditches.

Of course such an arrangement is expensive, and each farmer must pay for his water at a certain rate, as each tenant of a house in a city pays for his water or gas. That a farmer can afford to pay for water, however, is well shown in this case; for on the upper side of the ditch, which cannot be reached by the water, the land is fit only for grazing, while on the lower side there are rich fields of grain, vegetables, and alfalfa. The latter, like clover and hay, is fed to stock. It is one of the most important crops of the arid regions, where there is much demand for fodder for cattle, hogs, sheep, and horses.

(2) *Expense of such irrigation, and its advantages*

Without irrigation, crops could not be grown in this vicinity. It would then be necessary to bring farm products from Kansas, Nebraska, and other states, a distance of several hundred miles. It is evident, therefore, that irrigation must have had a great influence on the settlement of the West. Without it DENVER and PUEBLO would not be so important as they are; and, because of the expense of carrying food so far, scores of mining towns would not exist. Wherever the waters of the rivers are led out over the fields, people form settlements, and even towns and small cities. That is the case at GREELEY, in Colorado; CHEYENNE and LARAMIE, the principal

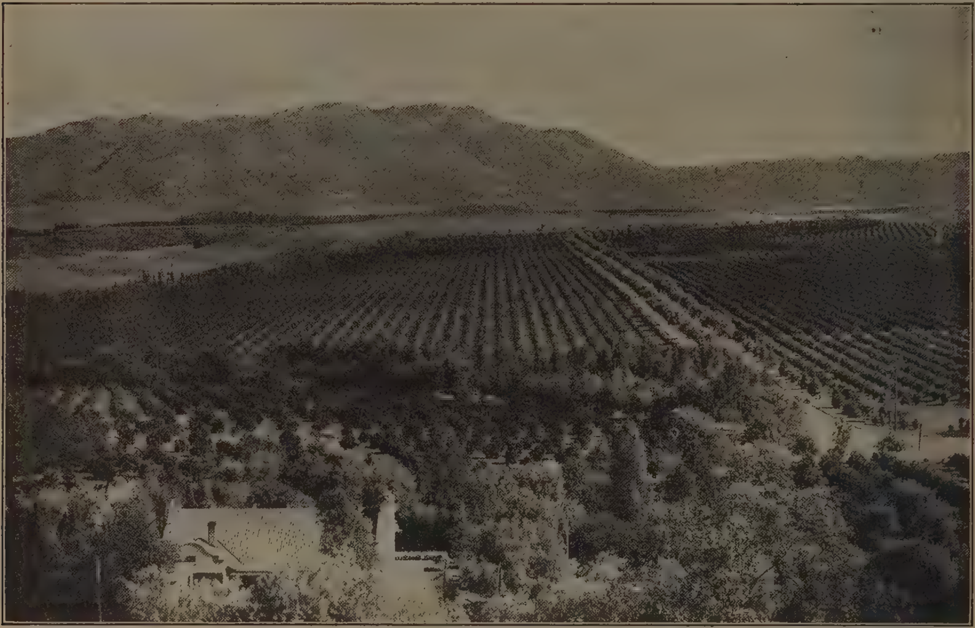


FIG. 175. — An orange grove in southern California on land which not many years ago supported only the sparse vegetation of an arid climate.

cities in Wyoming; and scores of other places.

One of the best farming districts in the arid lands is in Utah. A large part of that state was once a desert. But extensive areas have been entirely changed by the Mormons, a religious sect founded in New York, in 1830, by Joseph Smith.

3. In Utah, by irrigation

Under the leadership of Brigham Young these people migrated into the then unknown West and settled a few miles from Great Salt Lake. Here they commenced to build SALT LAKE CITY, which is now one of the most beautiful cities in the country. They also began to raise crops by irrigation, and to plant fruit trees, and thus converted portions of the desert waste into beautiful gardens.

There are now in Utah many who do not accept the Mormon religion. Agriculture is no longer the sole industry. As you have already learned (p. 124), many rich mines have been opened in this state. There are numerous busy towns and cities, the one next to Salt Lake City in size being OGDEN, which lies north of the capital.

4. In central and southern California, by irrigation

(1) The climate here, and the method of irrigation

Central and southern California is a third section noted for its extensive irrigation. The region is far south, and its shores are bathed by warm ocean waters, so that the climate is delightful. But the land, although very fertile, is arid by nature, and in places almost a desert (Fig. 165). Vapor condenses on the mountains, however, and forms streams whose water is stored in immense reservoirs and led into long irrigating ditches. Other irrigating ditches are supplied with water from wells. The bringing of water to the parched soil has changed even the desert parts of this region into one of the garden spots of the world. The rainfall increases toward the north, and irrigation becomes less and less necessary as one goes northward. Thus there is every gradation in California, from farms, orchards, and vineyards that could not exist without irrigation, to those, already described, which require no irrigation.

(2) The products

Oranges, lemons, peaches, pears, grapes, figs, olives, walnuts, almonds, and many other kinds of fruits and nuts, now grow here in abundance. Among the fruits the most common is the seedless navel orange. In these beautiful valleys nearly every home has its orange trees, and in many cases the house is entirely surrounded by them (Fig. 175).

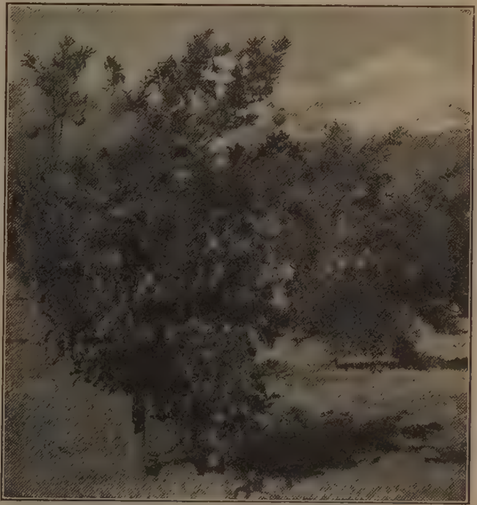


FIG. 176.— An orange tree in southern California. Notice the snow on the mountain only a few miles away.

Thousands of persons from the East were first attracted to California by the mild and healthful climate; then, seeing the opportunity for fruit raising, they planted orchards and orange groves. In those valleys which are too cool for oranges, thousands of acres are devoted to other fruits, such as prunes, apricots, grapes, pears, and apples. Land that a few years ago was worth, at best, only a few dollars an acre, now supports flourishing groves of fruit.

The groves of all kinds are planted in

straight rows, and the ground is kept so clean by frequent plowing that scarcely a weed is to be seen. In this respect the groves present a very different appearance from the orchards, overgrown with grass and weeds, that are often seen upon farms of the East.

(3) *Care of the fruit, and what is done with it*

The winter season is the harvest time for oranges, which are picked from about the middle of November until February or later (Fig. 176). They are cut from the trees, sorted according to size, then packed in boxes and shipped away.

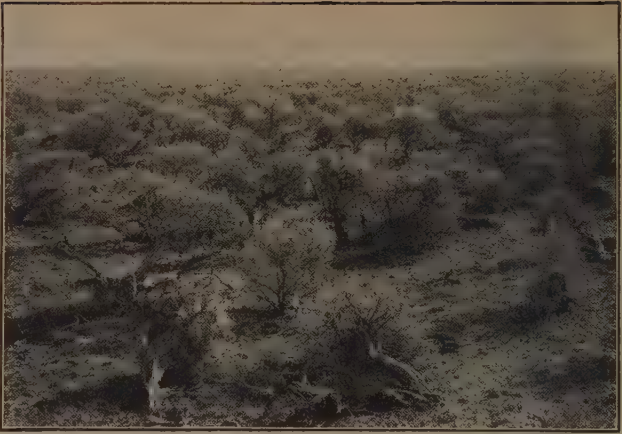


FIG. 177. — Desert land in the Yakima Valley, covered with the worthless sagebrush. Such land without irrigation is of almost no value; but compare this picture with Figure 178.

Immense quantities of peaches, prunes, apricots, grapes, figs, and other fruits are dried, usually by exposure to the sun. In the Eastern States fruit would soon decay if left out of doors, but in the sunny climate of the arid lands it dries quickly. Much fruit is also canned, and many grapes are made into wine. California wine is of such high quality that it is sent not only to the East, but even to Europe.

The value of irrigation is well shown here. Before irrigation was introduced into southern California, this region could support very few people. Now, in LOS ANGELES and vicinity, there is a population of over three hundred thousand.

5. In other irrigated sections

The description of these few places serves to show the importance of irrigation in the West. It is not to be understood, however, that these are the only noted irrigated sections, for there are many others. Most of the largest and best known are along the large rivers. For example, irrigation is extensive along the Yellowstone and Missouri rivers and their tributaries in Montana; along the Snake River and its tributaries in Idaho; along the Yakima River (Figs. 177 and 178), and other streams tributary to the Columbia River in Washington, Oregon, and Idaho; along the Gila and Salt rivers in Arizona; along the Rio Grande and Pecos rivers in New Mexico; and along the Sacramento, San Joaquin and other rivers in California. The map (Fig. 258) shows that there are many irrigated sections.

The irrigation of Arizona deserves especial mention, partly because of the extensive irrigation works that the government has constructed there, and partly because of the climate. One of the greatest irrigation works undertaken is the Roosevelt dam in the Salt River, which will supply water for a large area near PHŒNIX. The climate near

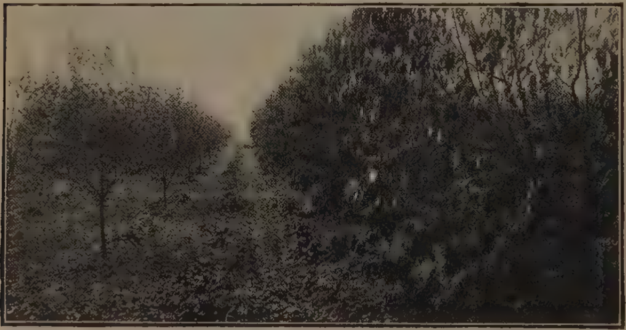


FIG. 178. — Desert land in the Yakima Valley which only a few years ago was covered with sagebrush like that in Figure 177. Now, being reached by an irrigation ditch, it supports a flourishing young peach and apple orchard and is worth $1000 an acre.

this city and TUCSON is such that even semi-tropical fruits are produced. Here are raised oranges, lemons, grape fruit, figs, olives, pomegranates, and even dates. The warm, dry climate also makes this region an important health resort.

6. Government work in irrigation

So important is irrigation that it is being introduced wherever possible, and every year new irrigation systems are being built, some of them at great expense. Since much of the arid region is public land, the United States government is aiding in this work. There is, in fact, a special department of the government in charge of it, and every year millions of dollars are being spent in this way.

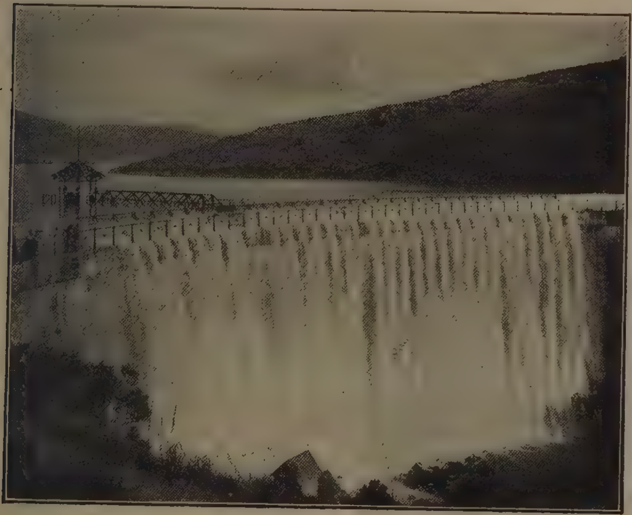


FIG. 179. — A masonry dam built by the United States government, forming a large lake in which water is stored for use in irrigation during the summer.

Enormous dams are built (Fig. 179), forming large lakes in the mountain valleys, and these are filled in spring when the snow melts. Then, in summer, when the crops need water, it is let out of the reservoirs into the irrigation canals. In this way the amount of farm land in the arid West is being greatly increased. This is one of the most important works in which our government is engaged.

7. Ranching

(1) Kinds of animals raised

There is so little rainfall in the arid portion of the West that only a small part of the land can be irrigated. This leaves most of the country for grazing; and wherever there is water enough for the animals to drink, cattle, horse, and sheep ranches are found. In some parts, especially where the grass is scanty, herds of goats are raised.

(2) How sheep ranching is carried on

The manner in which cattle ranching is carried on in Dakota was described on pages 99–101, and much the same plan is followed for cattle and horses in all the Western States. Sheep ranching is somewhat different, as may be seen from the ranches about BILLINGS, Mont.

A good-sized sheep ranch has from twenty-five thousand to forty thousand head of sheep. These, like cattle, may feed partly upon government land, or the "range," and partly on land fenced in and owned by the ranchman. During the coldest winter weather, when the snow may be so deep that the sheep cannot obtain food, they are often driven into protected *corrals* and fed on alfalfa. The fierce winds of the open plains help them, however, by drifting the snow and thus leaving open patches where they can find grass.

When the sheep are feeding on the range, one man, with a dog (Fig. 180), can herd twenty-five hundred; and if he has a horse to ride, he sometimes takes care of five thousand. Selecting a spot near water for a camp, the herder drives his sheep out each morning, and back at night, going each day a distance of two or three miles from camp. When the grass is eaten in one place, the camp is moved; then, from the new point as a center, they wander out as before.

The life of the herder is extremely lonely, both day and night being spent with the sheep. Once a week a man brings him food; and for weeks, and even months at a time, the only company he has, aside from his sheep, is his dog, and possibly his horse.

(3) *Sources of profit*

After the winter is over, the first income to the ranchman comes from the sale of the skins, or pelts, of sheep which have died during the cold weather. He expects to lose about one sheep in twenty each year from this cause.

The next harvest comes from the wool (Fig. 181). Men who make it their business to shear sheep travel in squads of about twenty-five. They erect sheds and pens near some sheep center, such as BILLINGS, and shear all the sheep that are brought to them. Sometimes sheep are sheared at the ranch, but many ranchmen prefer to drive them near to a market, before they are sheared. This saves the expense of hauling the wool to the railway station, and besides, the sheep graze on the way to and from the market.

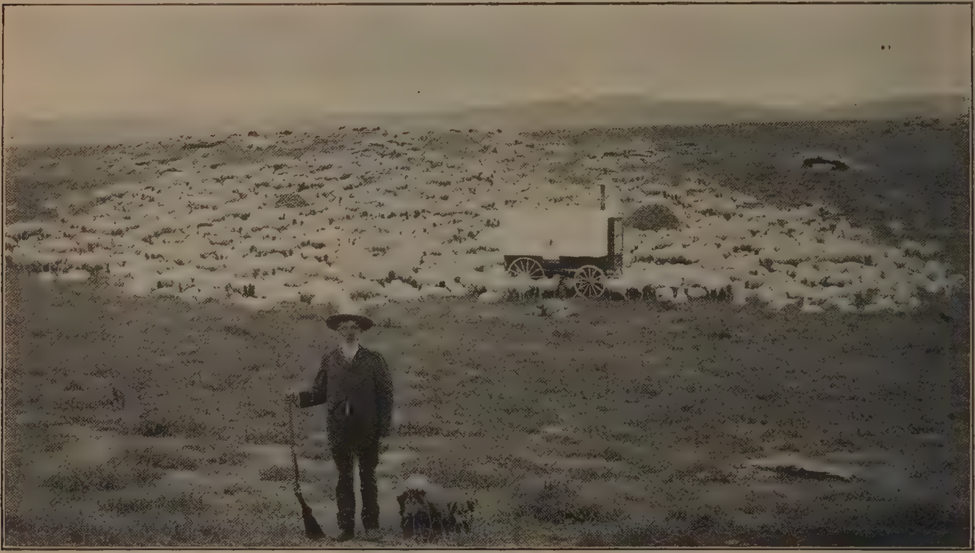


FIG. 180.—A Montana sheep herder with his dogs and his flock.

In the Southwestern States sheep are often sheared twice a year; but farther north it is done only once, and then as near the month of June as possible. Can you suggest a reason for choosing that time? After the wool is cut, it is pressed into bales and shipped to various markets in the East. Where should you think it might be sent, and for what purposes used?

From July on, many sheep are sold for mutton. Those that are from three to five years old, and that have already borne a quantity of wool, are usually selected for this purpose. The hides are useful for leather and the bones for fertilizing the soil.

Manufacturing

1. Extent of the manufacturing

A newly settled country has little manufacturing. Consequently many manufactured articles that are needed in the West must still be brought from the East. As in the Southern States, however, rapid changes have been going on, and the West is fast becoming an important manufacturing region. Already in some parts, as in Colorado and on the Pacific coast, there is a great deal of manufacturing.

There is every reason for believing that this progress will continue; for the West has great resources, including immense deposits of coal and petroleum for fuel, as well as abundant water power. Furthermore, the demand for manufactured articles is increasing, because many people are settling in this section.

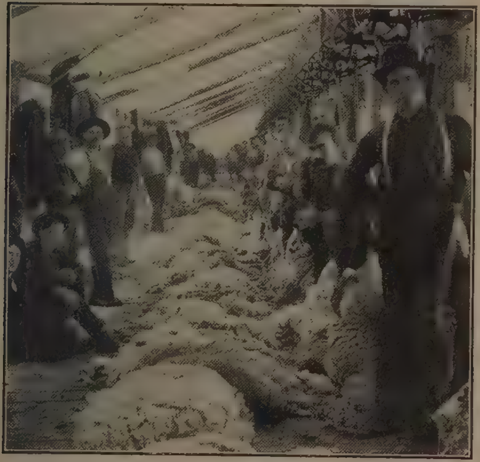


FIG. 181.—Shearing sheep in Montana. The men hold the sheep and the wool is clipped off by machinery. There is a great pile of this wool along the middle of the shed.

2. Principal kinds

One of the most extensive kinds of manufacturing in the West consists in separating the metal from the ores. After the ore is taken from the mines, it must usually be crushed, the worthless parts must be washed out, and the remainder sent to the smelters (Fig. 182), where the metal is extracted by a difficult process. The machinery for crushing and smelting is so expensive that ores from many mines are sent to one place, and must sometimes be carried a long distance. For example, the mines near LEADVILLE send their ore to that city, but many mines in Colorado ship ore to the smelters at DENVER and PUEBLO.

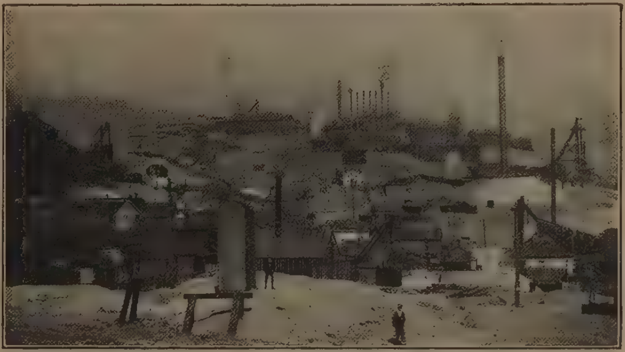


FIG. 182.—Mines in Butte, Montana, where copper is obtained from the ore.

All the ores must be treated in some such way. Thus the crushing and smelting of ore is an important industry in many of the Western cities. The metals thus obtained are also manufactured into various articles in the larger cities.

The manufacture of lumber and articles made of wood, such as paper, furniture, and farm implements, is already extensive in some places, and is rapidly increasing.

As we have seen, the West is, to a large extent, a fruit and wheat region. On that account the canning and drying of fruits, and the making of flour and other products from wheat, are very important industries. The abundance of fish gives rise to the canning industry in certain places, and the great numbers of cattle and sheep supply hides and wool not only for shipment to Eastern factories, but also for manufacture in the West.

Transportation of goods

The development of manufacturing in the West has been made possible largely by the building of railroads (Fig. 183). There is a remarkably large number of railroads here, considering the difficulty of building them and the recent settlement of the country. On Figure 280 observe that each of the great cities on the coast is connected by rail, not only with the others, but also with the East by one or more transcontinental railways. Count the railroads that cross the Western States, and learn their names. When the Union Pacific, the first of these, was completed, in 1869, it was thought to be a wonderful work, and of enormous importance; but now that there are so many railroads, people are inclined to overlook their great value.

Railroads are of especial value in the interior of the West, where there is very little opportunity for transportation by water. The scarcity of navigable streams is partly due to the fact that the rivers are few and shallow, and partly to the fact that many of them descend rapidly to the sea, and therefore have rapids and falls that prevent navigation. Notable exceptions are the lower Sacramento and the Columbia, on which rivers boats carry an extensive commerce.

Although harbors are not numerous, there are several excellent ones, sufficient to carry on traffic with all parts of the world. The importance of these ports has been greatly increased since the opening of the Panama Canal. Can you explain why?

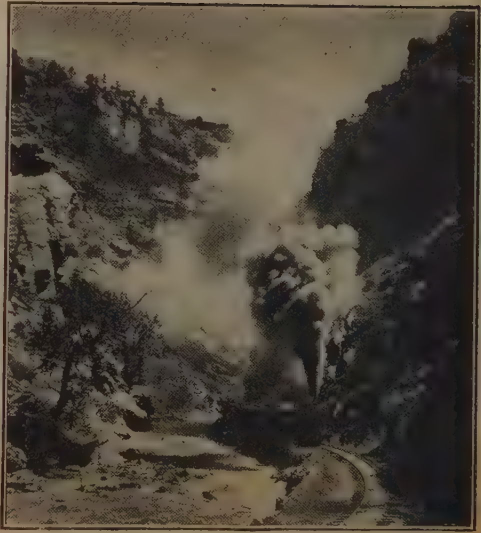


FIG. 183. — A railroad in one of the canyons in the Rocky Mountains of Colorado.

Leading cities in the interior

Large inland cities in the Western States are few in number, partly because there are no important waterways. There are, however, so many railways that some large cities have developed, especially at the junction of important trunk lines.

1. Denver and Colorado Springs

The greatest of the interior cities is DENVER, the capital of Colorado. This city is located on the site of a small mining camp, but its growth is chiefly due to two facts: (1) the numerous mining towns among the mountains near by; and (2) the near presence of water, which has made irrigation on a large scale possible (p. 129). The first fact calls for an important trade and manufacturing center somewhere in that region, and the second makes it possible to secure food.

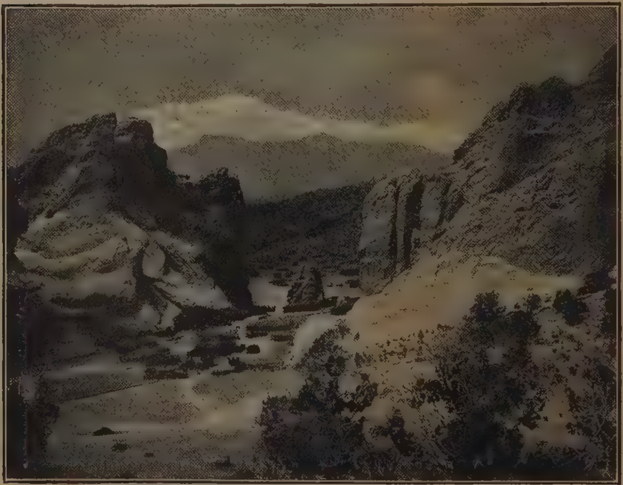


FIG. 184. — Pike's Peak from the Garden of the Gods, near Colorado Springs.

Denver has now become a very important railway and manufacturing center, where ore is smelted, and machinery, flour, and cloth manufactured. It is also of importance as a health resort, for the altitude of over five thousand feet and the dry climate are especially favorable to persons suffering from diseases of the lungs. COLORADO SPRINGS, south of Denver, at the base of Pike's Peak (Fig. 184), is one of the leading health resorts in the country.

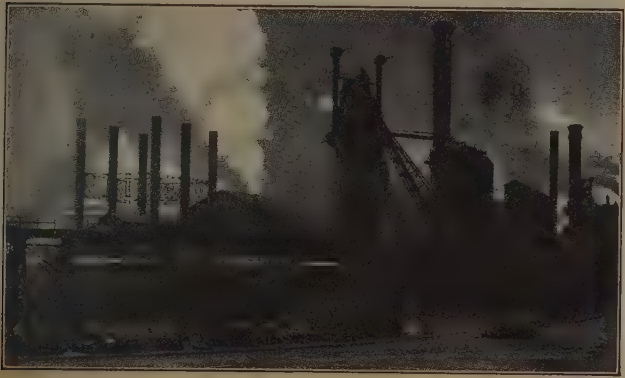


FIG. 185. — Blast furnaces and steel works at Pueblo, Colorado.

2. Pueblo

PUEBLO, a trade and manufacturing center, is situated south of Denver, where the Santa Fé line meets the Denver and Rio Grande Railway. Here much ore is smelted, and iron goods are manufactured (Fig. 185). It is the nearness to coal and iron ore which makes the latter industry possible.

FIG. 186. — The fall in Spokane River at Spokane, Washington.

3. Spokane

SPOKANE, in eastern Washington, is situated on the Spokane River at a point where there is a large waterfall (Fig. 186). This supplies abundant water power, so that there is much manufacturing. Since the city lies in the midst of the fertile wheat region of eastern Washington, flour milling is of special importance, as at Minneapolis. From the forests of Idaho it receives lumber, and, as already mentioned, it has been greatly benefited by the rich mines of the near-by Cœur d'Alene district. Spokane is also an important railway center and distributing point for a wide area of country. It has grown very rapidly, and is now second in size among the interior cities. Two other cities in the interior of Washington are WALLA WALLA in the southeast and NORTH YAKIMA in the Yakima Valley.

4. Butte, Anaconda, and Great Falls

Some of the ore mined at BUTTE (Fig. 182) is crushed and reduced in smelters within the city limits. But most of it is sent to the smelters at ANACONDA, and many of the Montana ores go to the smelters at GREAT FALLS. In the process of smelting, fumes of sulphur pour forth from the tall chimneys and settle to the ground, killing almost all vegetation, and causing the country round about to appear barren and desolate. In spite of their appearance, however, these smelting centers are thriving and rapidly growing.

5. Other cities and towns in the interior

Several other interior cities, such as SALT LAKE CITY and OGDEN, have already been mentioned (page 131). Find others on the map. Most of these owe their importance chiefly to mining, farming by irrigation, and grazing. Name the capitals of the Western States. Which of these have been mentioned; and in what connection? Locate BOISE, the capital of Idaho, a city in the midst of a fertile irrigation district.

Leading cities on the coast

1. San Francisco and cities near by

(1) ***Names and locations of these cities***

The largest city in the Western States is SAN FRANCISCO (Fig. 187), located on a remarkably fine harbor, at the tip of the peninsula that shuts in the waters of San Francisco Bay. This harbor, like that of New York, was formed by the sinking of the coast. There are other important cities near San Francisco, the largest being OAKLAND, BERKELEY, and ALAMEDA. The former, which is much the larger, is the land terminus of several transcontinental railways and the center of large manufacturing and ship-building industries. Close to it is BERKELEY (Fig. 187), the seat of the University of California; and farther south is Stanford University. These are two of the most important universities in the West. There are others of note, however, for each

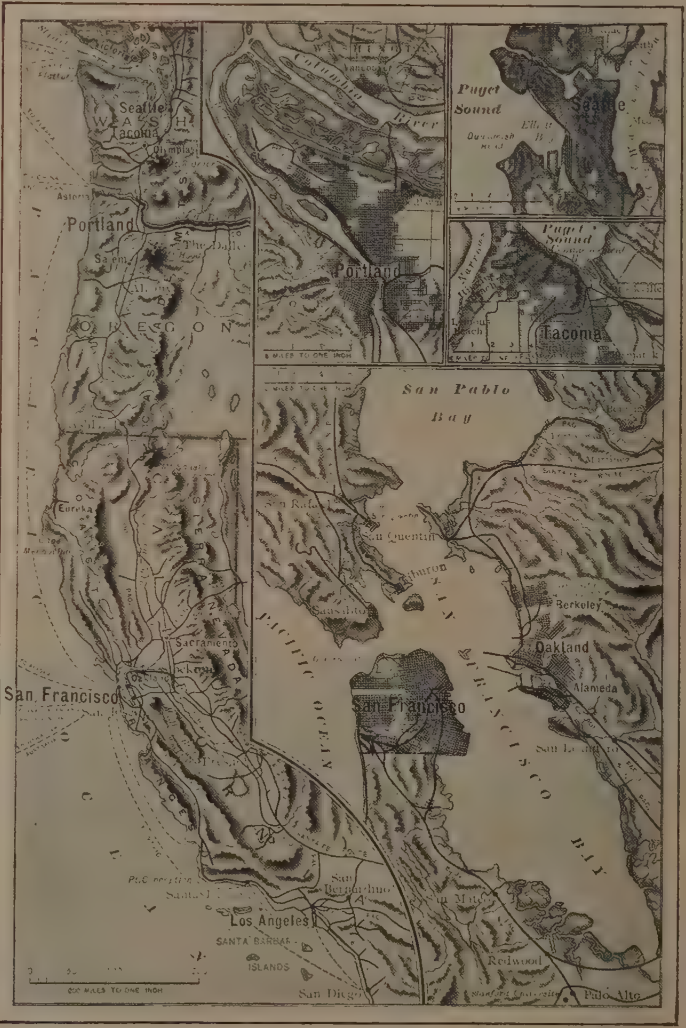


FIG. 187. — Map to show the location of San Francisco, Portland, Tacoma, and Seattle.

of the Western States supports a state university.

South of San Francisco is San José; northeast of San Francisco, on the Sacramento River, is Sacramento, the capital of California; and east of San Francisco is Stockton, at the head of navigation on the San Joaquin River. Trace these rivers, and observe the extent of the fertile Great Valley through which they flow.

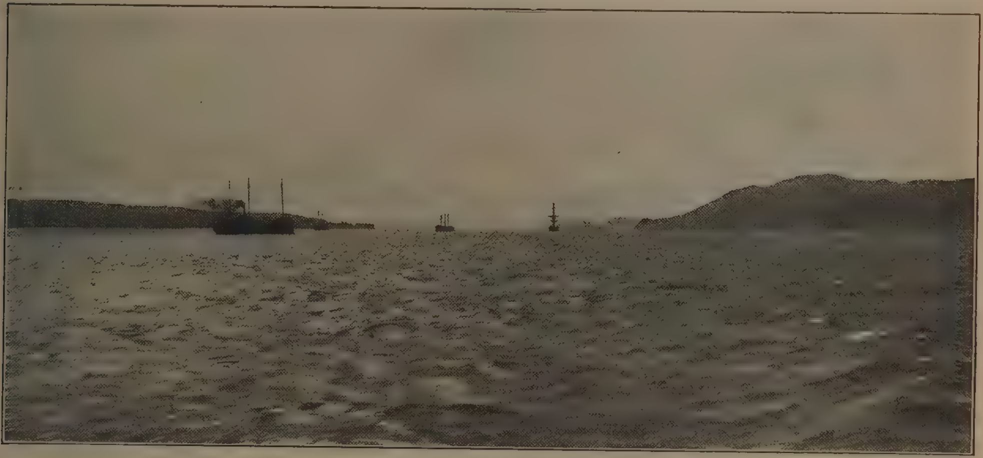


Fig. 188. — The Golden Gate, as the entrance to San Francisco Bay is called. Outside is the open ocean, while within is a broad, deep bay, protected from winds and waves and making a port where the largest ships may safely anchor.

(2) Their manufactures

The enormous crops of wheat, fruit, and wool in the Great Valley of California suggest some of the occupations in these cities. Among them are the canning of fruit, the milling of flour, and making of wine, and also of cloth.

The mineral products in this region have led to much smelting, and to the manufacture of metal goods of various kinds. In and near San Francisco foundries and machine shops are numerous, and shipbuilding is a great industry. One of our best-known battleships, the *Oregon*, was built here.

Sugar refining is another prominent industry, the raw sugar being brought from the Hawaiian Islands. The refining of petroleum is still another important industry, and brewing, distilling, and the manufacture of boots, shoes, and clothing are others. San Francisco, being by far the largest of the cities in this vicinity, leads in these industries.

Not much coal is mined in California, but, since this state produces more petroleum than any other in the Union, there is an abundance of oil for fuel. Coal is easily brought by train and boat from the Washington coal fields, and in the mountains there is an abundance of water power that can be used in generating electricity.

(3) Their shipping

San Francisco Bay (Fig. 188) is the only gap in the Coast Ranges for hundreds of miles, either to the north or the south; and since it is one of the finest harbors in the world, it is very important as the outlet to the Great Valley and the mining regions round about it. The principal products shipped from here are gold, silver, wine, fruit, wool, grain, and the various manufactured goods just named. Some go East by rail, but many go by boat to different parts of the world. Several transcontinental railways terminate on the shores of San Francisco Bay. For all these reasons this is a great shipping point, and, as our trade increases with the Philippines, the Hawaiian Islands, Japan, China, and other countries bordering the Pacific, the amount of shipping will increase.

Many goods are sent from Stockton, Oakland, and other points on or near the bay; but San Francisco is the leading center for the shipping, as for the manufacturing.

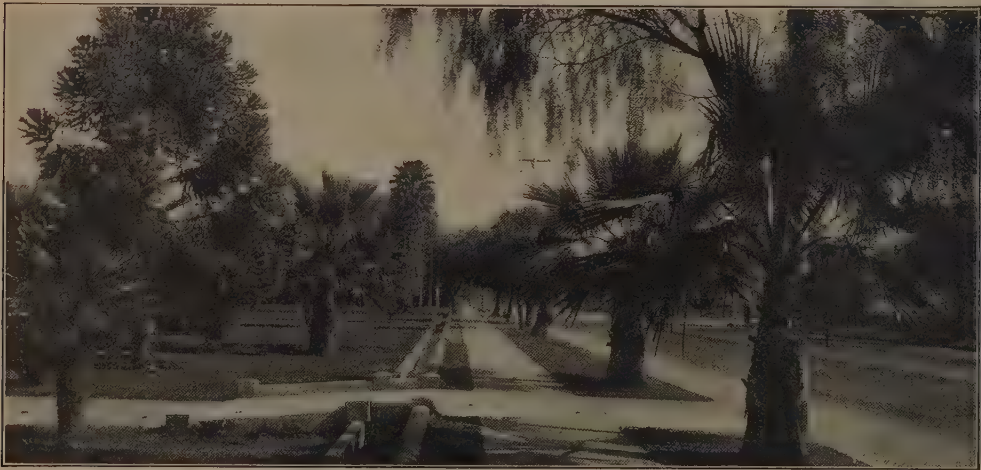


FIG. 189. — A street in Los Angeles bordered by palms and other warm-climate trees.

2. Coast cities south of San Francisco

The next important harbor south of San Francisco is the port of Los Angeles, twenty miles from LOS ANGELES itself, where a fine artificial harbor has been made at great expense. Still farther south is the fine natural harbor of SAN DIEGO. Estimate the distance of these points from San Francisco (Fig. 187).

Los Angeles is one of the most beautiful cities in the country (Fig. 189). It lies in the midst of the rich orange country (Fig. 175), and there are scores of small villages, towns, and cities round about it. Among the larger of these are PASADENA, POMONA, RIVERSIDE, REDLANDS, and SAN BERNARDINO. Los Angeles is the chief distributing center for this productive region. It has had such a rapid growth that it is now the second city in size in the Western States.

3. Coast cities north of San Francisco

(1) Portland and vicinity

The first large city north of San Francisco is PORTLAND (Fig. 187) on the Willamette River, a tributary of the Columbia. Like New Orleans, it is situated about a hundred miles from the ocean, near the head of deep-water navigation.

Since good harbors having connections with the interior are lacking, most of the other important towns of Oregon are inland, and Portland has grown to be the chief shipping point by water, and therefore the largest city in the state. From this point wheat, flour, fruits, wool, and lumber (Fig. 190), the leading products of Oregon, are shipped in great quantities.

Portland has extensive manufactories of woolen goods, flour, and furniture; and SALEM, the capital, situated in the fertile Willamette Valley, also has large woolen and flour mills. Farther down the Columbia is ASTORIA, where, as elsewhere along the river, the salmon industry is developed. It is also an important shipping point.

Portland, one of the most beautiful cities in the West, is growing rapidly in industry, commerce, and population, its recent growth being most remarkable. It has an extensive and increasing trade with the Orient, and there is also important commerce with Alaska. Portland is one of the great lumber ports in the world, and one of the leading wheat and flour shipping points on the Pacific coast.

(2) *Cities on Puget Sound*

Washington, unlike Oregon, has many fine harbors. On two of these SEATTLE and TACOMA (Fig. 187) are situated. Coal, lumber, grain, and hops are the principal exports. There is also extensive manufacture of lumber, furniture, and other goods along the shores of Puget Sound, especially at Seattle (Fig. 191), and Tacoma. These goods are shipped to the Eastern cities, to China, Japan, the Philippines, Alaska, and other countries. BELLINGHAM and EVERETT on Puget Sound, is an important ship building yard at Seattle, in which the battleship Nebraska was built; the largest salmon cannery in the world is located at Bellingham; and there is much other manufacturing. Indeed, the rapid development of manufacturing in the cities of Puget Sound has been one cause for their great growth and prosperity.

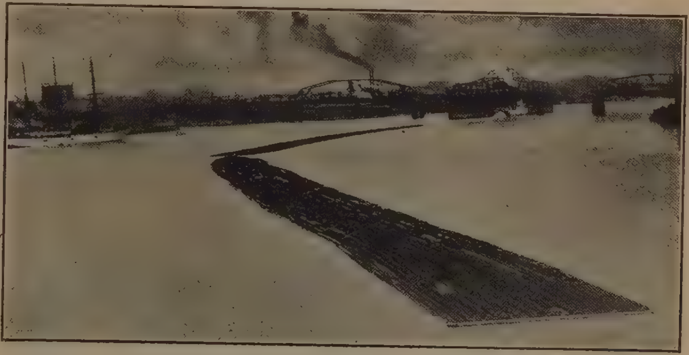


FIG. 190. — A raft of logs floating down the Willamette River to the sawmills at Portland, which is seen in the distance.

The cities of Puget Sound, especially Seattle, have the bulk of the trade with Alaska, as well as much commerce with the Orient, to which steamers ply regularly from Seattle. To these Puget Sound ports most of the gold, salmon, and other Alaskan

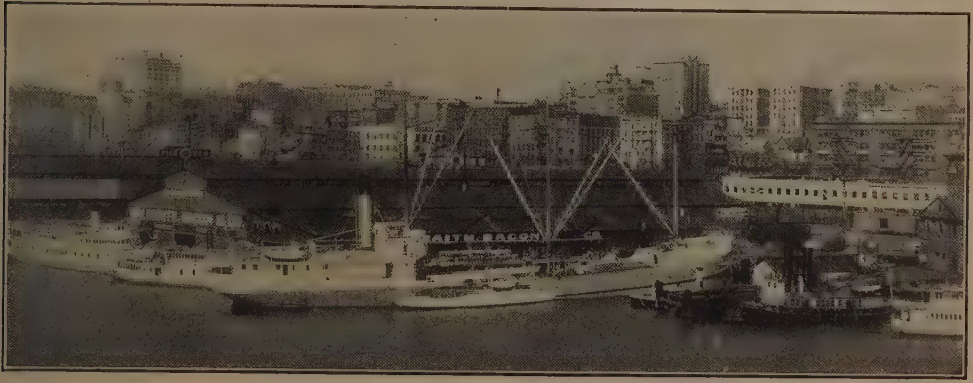


FIG. 191. — A view of a part of Seattle from the harbor.

though smaller, have important lumber and other industries. There is a large smelter at Tacoma, to which ores are sent from even as distant a point as Alaska; there products come, and from them the regular Alaskan steamers sail, carrying many miners and other passengers, and large cargoes of goods for use in that Northern territory. Seattle is the place of outfitting for most of the people who go to Alaska; and the rapid development of that territory has brought much business to this city, whose recent growth has been remarkable. Both Tacoma and Seattle are beautifully situated on the shores of Puget Sound, and from both the extinct volcano, Mount Rainier, is plainly visible. There are many fine public buildings in each city, and in Seattle is the University of Washington, one of the most rapidly growing and progressive state universities of the West.

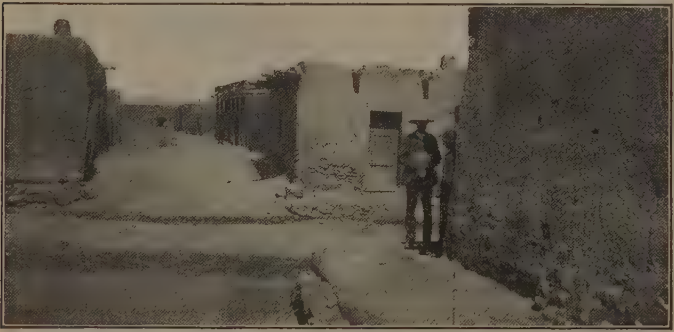


Fig. 192. — A street in a small town in New Mexico, with adobe houses belonging to the Mexican inhabitants.

Another Pacific coast port is Gray Harbor, at the mouth of Chehalis River in Washington, west of the capital Olympia. Transcontinental railroads have extended their lines to it, and there is already trade in lumber and grains with the Oriental ports.

Our newest states

When this Western country was first settled, it was divided into territories, but as the population increased, these territories have one by one been admitted into the Union as states. The last to be admitted are Arizona and New Mexico in 1912.

1. Their resources

There are many fertile valleys in these new states where there is irrigation; and, in this warm climate, wheat, corn, vegetables, alfalfa, apples, peaches, grapes, and many other crops are raised. While some of the farming is carried on by Mexicans and Indians, best results are gained by Americans who own a large part of the irrigated land. The United States government is spending large sums of money in building storage reservoirs, and in improving the irrigation systems in other ways, so that many settlers are finding valuable farm lands here.

The plateaus and mountain valleys are the seats of extensive cattle and sheep ranching, and, as we have already learned, mining is of great importance. Arizona, besides being second in the production of copper, also produces large amounts of gold and silver, while New Mexico supplies much gold, silver, and coal.

2. Their cities

The cities, though not of great size, are important distributing centers for the surrounding country, and also centers for smelting the ores. Among the most important are Tucson, Prescott, Bisbee, and Phœnix in Arizona, and Albuquerque, which is the largest city in New Mexico.

Among the early Spanish settlements is Santa Fé, the capital of New Mexico. Here, as elsewhere, in the state, the houses are mostly low, one-story buildings (Fig. 192) made of sun-dried bricks, or *adobe*. The Spanish language is most commonly heard, and in some parts one still sees the primitive customs of a century ago. For instance, on the small Mexican farms near by, wheat, instead of being threshed out by machines, is in some cases spread upon the ground and trampled by goats until the grain is separated from the hull. The grain is then tossed into the air in order that the wind may carry away the chaff. These customs form a very striking contrast to those introduced into most parts of the region by progressive Americans, who use the most approved methods of farming and the best of farming implements.

3. Their Indian inhabitants

This is the region in which some of the most civilized Indians once lived (p. 22); and here some of their descendants still occupy *Indian reservations*, or land reserved for them by the government. The Pueblo Indians, for instance, still live here after the manner of their ancestors. Their homes, called *pueblos*, are built of adobe, and in some cases are entered from the roof by means of a ladder (Fig. 37).

The pueblos were intended as strongholds for the storing of grain and for protection against wandering tribes, which might attack them at any time. Other Indian houses, the *cliff dwellings*, were built on the sides of cliffs beneath overhanging ledges; and still others, *cave dwellings*, were in caves dug out of the rocks by the Indians (Fig. 193).

Some of the Pueblo Indians carry on farming by irrigation, as their ancestors did before the white men came; and many of them are prosperous farmers. Other Indians on reservations are more shiftless, and the government has to help them to make a living. The same is true of Indians in other parts of the West, for there are Indian reservations in all the Western States. The red men are no longer allowed to roam at will, but must live on the land allotted to them by the United States government.

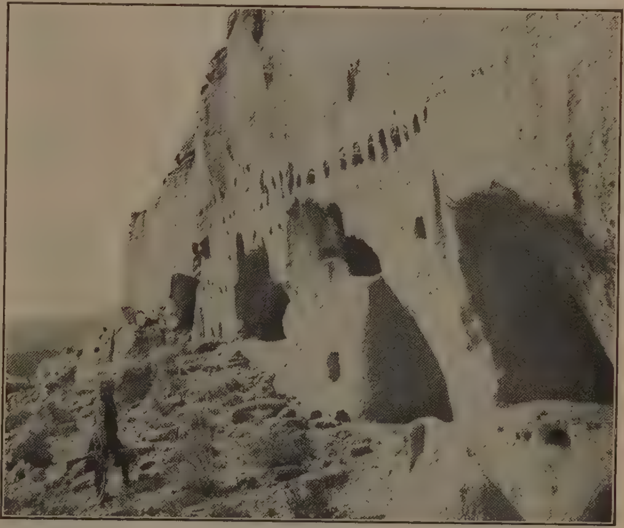


FIG. 193. — The cave dwellings of the southwest. The Indians dug these caves out of the solid rock and lived in them.

Scenery in the West

1. The most noted places

In many places among the Western mountains are scenes that compare favorably with those of the Alps, which attract so many Americans abroad. Strangely formed cliffs, deep canyons, and imposing waterfalls are present without number. There are also beautiful snow-capped volcanic cones and glaciers. Many of these grand scenes may be viewed from the railway, as, for instance, the wonderful gorges and canyons through which the Denver and Rio Grande Railway winds its way across Colorado. Among all the interesting places in the West, however, are three that easily surpass the others in grandeur. These are the Yellowstone National Park, the Grand Canyon of the Colorado River, and the Yosemite Park.

2. The Yellowstone Park

(1) Its hot springs and geysers

The Yellowstone Park, chiefly in Wyoming, is a tract of land, larger than Connecticut, which the government has set aside as a national park. It is often called the "Wonderland of America." A stage road leads from the Northern Pacific Railway to the Mammoth Hot Springs on the northern side of the park. There is also a stage route from the Oregon Short Line on the western side. At the Hot Springs from openings in the hillside, heated water flows down over beautifully colored terraces, which have been built by a deposit of mineral matter carried in solution in the hot water. Farther on are boiling springs; also boiling mud springs of different colors; and here and there is a spring, called a *geyser*, from which hot water and steam now and then burst forth with great violence, even to a height of one hundred or two hundred feet (Fig. 194).

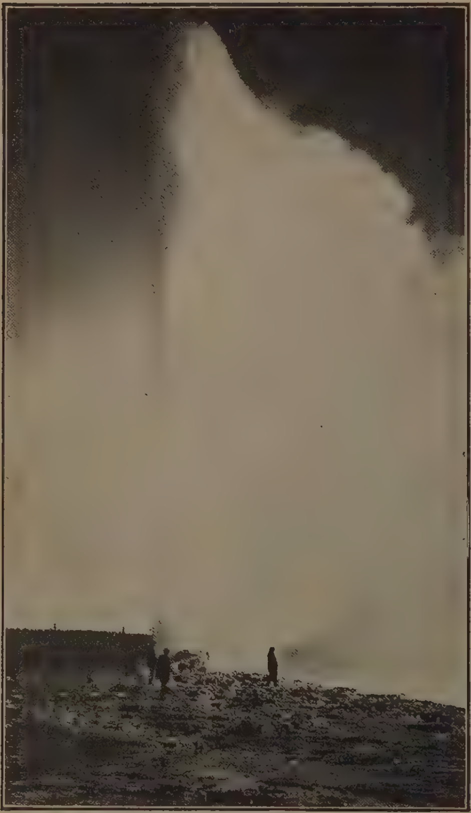


Fig. 194. — "Old Faithful" geyser in eruption.

"Old Faithful," one of the most regular of these geysers, "plays" at intervals of sixty-five minutes. Then a column of steam and hot water shoots upward from one hundred to one hundred and thirty feet. Other geysers discharge at much longer periods, as two to three hours, or several days; and in some of the geysers the roar of escaping steam lasts for hours after the water has all been expelled. The outbursts are really explosions of steam, the heat being supplied from the depths of the earth. Some of the springs are on a level with the ground, so that a visitor must be on the lookout lest he step into one; others are surrounded by a rim several feet high.

(2) *Its lake, falls, and canyon*

Beyond the geyser basins the Yellowstone Lake is reached, a beautiful sheet of water, nestled in the mountains, nearly eight thousand feet above the sea. Its waters flow northward, forming the Yellowstone River, a tributary of the Missouri.

To many persons, the falls and canyon of this river are the greatest wonders of the park. Soon after leaving the lake, the stream narrows and quickens, and the water leaps one hundred and nine feet directly downward. A short distance farther on it tumbles three hundred and eight feet, or almost twice the height of Niagara (Fig. 195). The river then runs between steep walls, which rise one thousand feet above it. This canyon is somewhat winding, with numerous bold cliffs jutting far out into the abyss; and from these cliffs grand views may be obtained. Far below, one sees the silvery stream, too distant to be heard as it dashes along. Across the chasm, a half mile away, dark green pines fringe the bank, and between the water and these woods are gorgeously colored rock walls, having all the tints of the rainbow.

(3) *Its animals*

In this park hunting is prohibited, and for that reason wild animals are numerous and quite tame. When driving through the park one can sometimes see elk by the

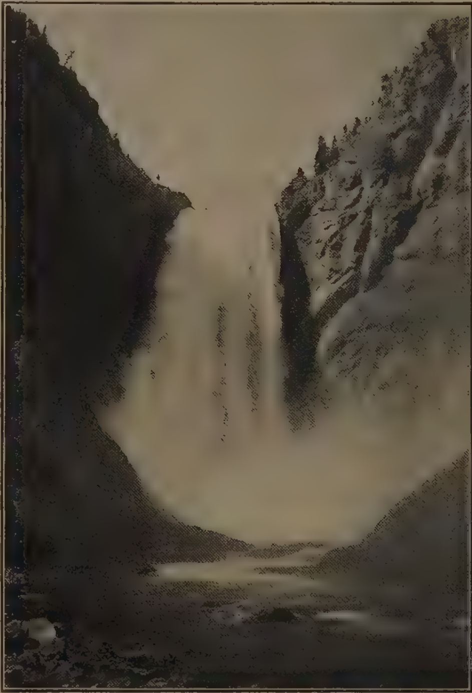


Fig. 195. — The great falls of the Yellowstone, three hundred and eight feet high.

roadside; and bears, both grizzly and black, come close to camps and hotels for food. There are many other animals here, among them some bison, or buffalo (Fig. 196).

3. The Canyon of the Colorado River

One portion of the Grand Canyon of the Colorado, in Arizona, may be reached on the Atchison, Topeka, and Santa Fé Railway. The wonderful Yellowstone Canyon, just described, and the canyons on the Denver and Rio Grande in Colorado are pygmies compared with this.

As one first looks out into the canyon, he sees nothing but rock towers, pinnacles, many colored layers of rock, and apparently bottomless depths. When he finally reaches a point from which the threadlike stream may be spied at the bottom of the abyss, a mile below, it seems almost impossible that so little water could have wrought such mighty havoc. Yet this river has been slowly cutting its way into the rocks for thousands of centuries, and this great gash, or canyon, is the result.

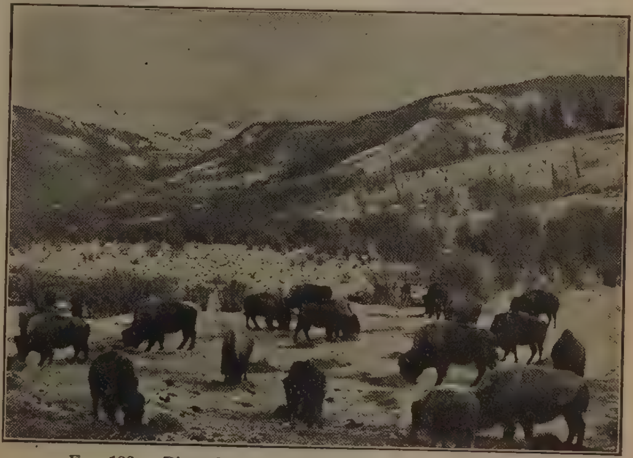


Fig. 196. — Bison feeding in the Yellowstone National Park.

The difficult path which leads to the bottom of the canyon is seven miles long, and the trip down and back is a full day's journey; but without making it, one fails to appreciate fully the marvelous carving, sculpturing, and coloring of the canyon walls. At the bottom the scene is entirely changed; and, as one looks upward, to see himself shut in by walls which seem to extend to the very heavens, his own littleness and the immensity of the works of Nature, are wonderfully impressed upon him.

For three hundred miles the Colorado River flows at the bottom of this deeply cut canyon, which forms a very complete barrier to travelers. A person living on one side, where he could see across to the other side, ten miles away, would need to travel hundreds of miles to reach that side; for there are no railways, roads, or paths leading across. The government has set aside this wonderland also as a national park for the enjoyment of the people.

4. The Yosemite Park

The remarkable Yosemite Valley, on the western slope of the Sierra Nevada Mountains, in California, presents very different views from those just described. This is the region of the High Sierras, a region of deep canyons and granite peaks, one of which, Mount Whitney, 14,502 feet high, is the highest point in the United States, not including Alaska. Some of the most magnificent views in the High Sierras are formed by waterfalls of the Yosemite Creek and Merced River, in Yosemite Park. In one mighty leap the water descends fifteen hundred feet, forming the Yosemite Falls (Fig. 197), which are famed the world over. Below this are some cascades, then another fall of four hundred feet.

Only a few miles from the falls are the giant trees of the world, the largest of which is 35 feet in diameter (Fig. 198) and 300 feet high. The Yosemite region, like the Yellowstone, is a public park, and is visited every year by thousands of people, including many Europeans.

5. Other scenic wonders

It would require a great many pages to describe all the wonderful scenes in Western United States, or even to make a list of them. But mention must be made of the grand Shoshone Falls in Idaho, Lake Chelan in Washington, Lake Tahoe in the Sierra Nevadas, and Crater Lake in Oregon — the great crater

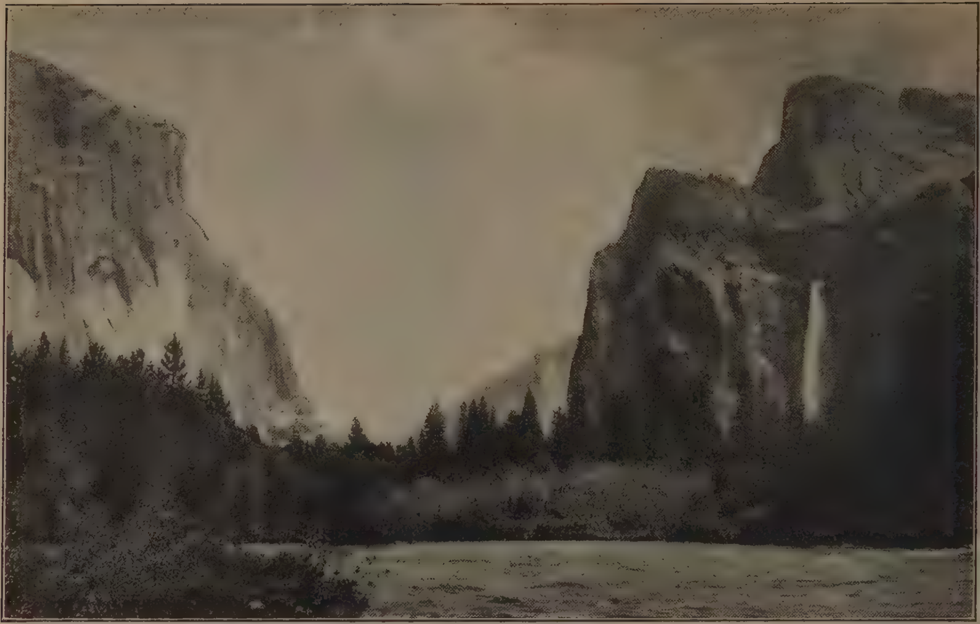


FIG. 197. — The Yosemite Valley, bordered by lofty granite precipices, over one portion of which the water leaps to form the far-famed Yosemite Falls.

of an extinct volcano in which a beautiful lake is now situated. Also the Rainier National Park on the slopes of Mount Rainier with its beautiful valleys, large glaciers, and grand mountain scenery.

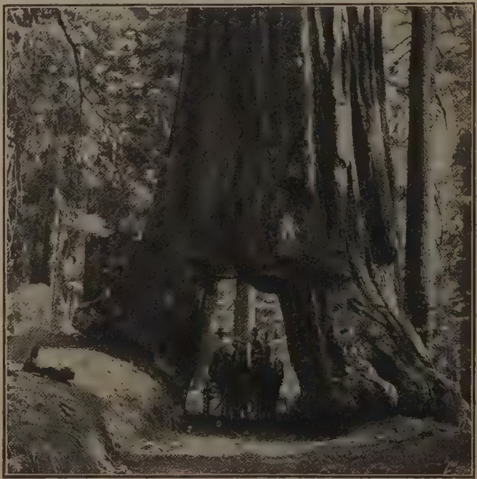


FIG. 198. — One of the "Big Trees" of California — so large that a wagon road passes through a tunnel cut in its trunk.

Review Questions 1. Tell about the discovery of gold in California. 2. What were the effects of this discovery? 3. Name and locate the three principal mountain systems in the West. 4. Describe the valleys between. 5. Where are volcanoes found? Of what importance is the lava? 6. What about the extent of the arid lands? 7. Where are the well-watered sections? State some facts about them. 8. What minerals are found here, and what about the ownership of the mineral lands? 9. Describe the three methods of gold mining. 10. What can you tell about noted mining districts in Nevada? 11. In Colorado? 12. In Montana? 13. In other Western States? 14. Where are coal and petroleum found? 15. What use is made of timber in the mines? 16. Where is the timber obtained, and what are the principal kinds of trees? 17. Describe the method of lumbering in Washington. 18. What is done with the logs and with the lumber from them? 19. Of what importance are the forest reservations? 20. What kinds of fish are caught, and where? 21. What do you know about agriculture in the well-watered Northwest? 22. How is irrigation planned near Denver? 23. What about the expense of such irrigation, and its advantages? 24. What do you know about agriculture by irrigation in Utah? 25. In southern California? 26. In other sections? 27. How is the United States government assisting in irrigation in the West? 28. How is sheep ranching carried on here? 29. What are the different sources of profit in that business? 30. What is the extent of manufacturing in the West? 31. Name the principal kinds of manufacturing. 32. What are the conveniences for transportation of goods? 33. State the principal facts about Denver and vicinity. 34. Pueblo. 35. Spokane. 36. Butte, Anaconda, and Great Falls. 37. Other cities and towns in the interior. 38. Name and locate the principal cities about San Francisco Bay. 39. What goods are manufactured in them? 40. What about the shipping at this point? 41. State the important facts about the coast cities south of San Francisco. 42. About Portland and vicinity. 43. About the cities on Puget Sound. 44. Name our two newest states, and tell about their resources. 45. Name and locate their principal cities. 46. What can you tell about their Indian inhabitants? 47. Name and locate the places in the West most noted for scenery. 48. Describe Yellowstone Park. 49. The Canyon of the Colorado River. 50. The Yosemite Park.

Review Questions by States

Montana (Mont.). 1. What industries are carried on in the eastern part? Why? 2. In the western part? 3. Name the chief cities in Montana, and tell how each is important. 4. What two large rivers drain this section? 5. Through what states do they flow before reaching the Gulf? 6. Draw an outline map of the state and, as each of the other states is studied, do the same for that.

Wyoming (Wy.). 7. What industries are carried on in this state? 8. What cities are mentioned? In what connection? 9. Find the Yellowstone Park, and tell for what it is noted. 10. This state is represented as having little grain, on the maps showing the principal grain-producing regions (Figs. 249 and 251). Why?

Colorado (Col. or Colo.). 11. Examine Figures 249 to 274 to see what are the industries of Colorado. 12. Why is there more water for irrigation in this state than in some of the others? 13. Trace the divide between the Pacific and Atlantic drainage, as it crosses Colorado. Trace it northward to Canada and southward to Mexico. 14. Name the cities in Colorado mentioned in the text, and tell how each is important. 15. Find the population of Denver (Appendix, p. 427). Compare it with that of other large cities in the Western States; also with that of New Orleans and of Buffalo.

New Mexico (N.M.). 16. What about the inhabitants? 17. What is said about the industries? 18. How large is the largest city (Appendix, p. 427)? 19. Compare it as to population with the largest city in Massachusetts; in Nevada.

Arizona (Ariz.). 20. What can you tell about the large river that crosses Arizona? 21. What cities and industries are mentioned? 22. What minerals are obtained here? 23. How does the largest city compare in size with the largest in New Mexico? In Colorado? 24. Find the population of Arizona. Of New Mexico.

Nevada (Nev.). 25. For what mines was Nevada famous? 26. Find its present population (Appendix, p. 425). Why are there so few people? 27. What about its present industries? 28. How may the government irrigation work be of special value to this state?

Utah. 29. Why is the Great Salt Lake salt? 30. What are the industries of this state? 31. What cities are mentioned? Tell about each. 32. Examine the maps, Figures 249 to 274, to see what products come from Utah.

Idaho (Ida.). 33. What metals are obtained? (See Figs. 263 to 273.) 34. What great river drains Idaho? 35. What mountain range forms the eastern boundary?

Washington (Wash.). 36. Compare the coast line with that of Oregon; of Maine. 37. What about the rainfall of this state? Compare it with that of Montana (Fig. 303). Why this difference? 38. What effect has the rainfall upon the industries? What are the principal industries? 39. What cities are mentioned in the text? What can you tell about each?

Oregon (Ore.). 40. What advantage do you see in the location of the largest city? 41. Compare it in size with Denver; New Orleans. 42. Examine the maps (Figs. 249 to 274) to see what is produced in Oregon. 43. What industries are mentioned in the text? 44. What cities are mentioned, and in what connection?

California (Cal.). 45. What about the rainfall? 46. What two rivers drain most of this state? 47. Describe the relief. 48. Name the cities mentioned; for what is each important? 49. What industries are found in this state? 50. What advantage do you see in the location of San Francisco? 51. Compare its population with that of Boston; Denver. 52. What caused the early growth of California? What effect has that had on other Western States?

General Review Questions

53. Which state has the largest population (Appendix, p. 425)? The smallest? 54. Compare each of these two with Massachusetts and New York in population. 55. Name and locate the eight largest cities (Appendix, p. 427). 56. Which of the five groups of states has the densest population (Fig. 246)?

Which the least dense? What reasons can you give?

Suggestions 1. Read about the expedition of Lewis and Clark from St. Louis to the Pacific coast in 1803–1806. 2. Find out about the early settlement and dispute about the ownership of Oregon. 3. What is the origin of the expression "to pan out"? 4. Why do the heavier rains on the northern Pacific coast come in winter? 5. Mention several of the advantages and disadvantages of having no rain for several months at a time, as in southern California. 6. Make a collection of minerals for the school. 7. Hydraulic mining has been largely prohibited in many parts of the West. Why? 8. Should the ditch that is to irrigate a certain field skirt its upper or lower edge? Why? 9. Which is the more easily irrigated, nearly level land, or land that is rough and hilly? Why? 10. Is southern California as liable to cold snaps as Florida? Why? 11. Make a list of articles made of wool. 12. In what year were Arizona and New Mexico admitted into our Union as states? 13. Write a story describing an imaginary visit to southern California. 14. Make a drawing of the Western States, putting in the principal mountain ranges, rivers, and cities.

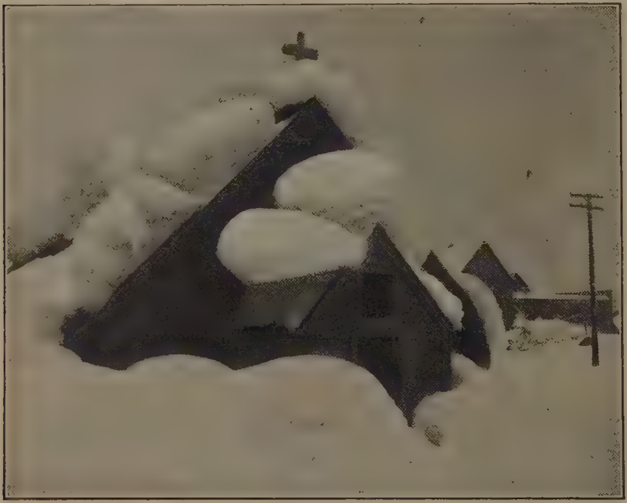


FIG. 200. — Scene after a winter snowstorm on the Alaskan coast.

General Review Questions for United States 1. Name the principal crops of the United States, and tell in which section each is raised. (Consult figures 249 to 259.) 2. Do the same for mineral products. 3. For other raw products. 4. For manufactured articles. 5. Name the ten largest cities in their order (Appendix, p. 426). For what is each important? 6. State some ways in which the rainfall influences the occupations of the people. 7. The temperature. 8. State clearly the influence of the sinking of the coast. 9. Of the glacial period. 10. Of the coal period. 11. Of the absence of forests on the prairies. 12. Of the rich mineral deposits in the West. 13. In what ways have the Great Lakes been of value? 14. Name some of the cities that have been benefited by them. 15. In what ways have the Mississippi River and its two largest tributaries been of value? 16. State some of the natural advantages that have aided the growth of Boston; New York; Buffalo; Philadelphia; Baltimore; New Orleans; Cleveland; Pittsburgh; Detroit; Chicago; St. Louis; and San Francisco. 17. Can you name some other cities that have also been influenced by their surroundings? 18. Which is the largest state (Appendix, pp. 425–426)? The second in size? The smallest? The next to the smallest? 19. Which state has the largest population (Appendix, p. 425)? The second largest? The smallest? Next to the smallest? 20. What states border Mexico? Canada? Draw a map of the United States.

IV. TERRITORIES AND DEPENDENCIES OF THE UNITED STATES

Our increase of territory

At the close of the Revolutionary War the United States consisted of thirteen small colonies, extending along the Atlantic coast from Maine to Georgia. Our new nation laid claim also to the land far into the wilderness, even to the distant Mississippi. Beyond this was French and Spanish territory, while the whole Mississippi Valley was occupied by Indians.

By purchase, by war, and by treaty, we have gained possession of all the other land between the Atlantic and the Pacific, which has thus far been described; but our control does not end with the boundaries of the United States proper. In 1867 we ob-

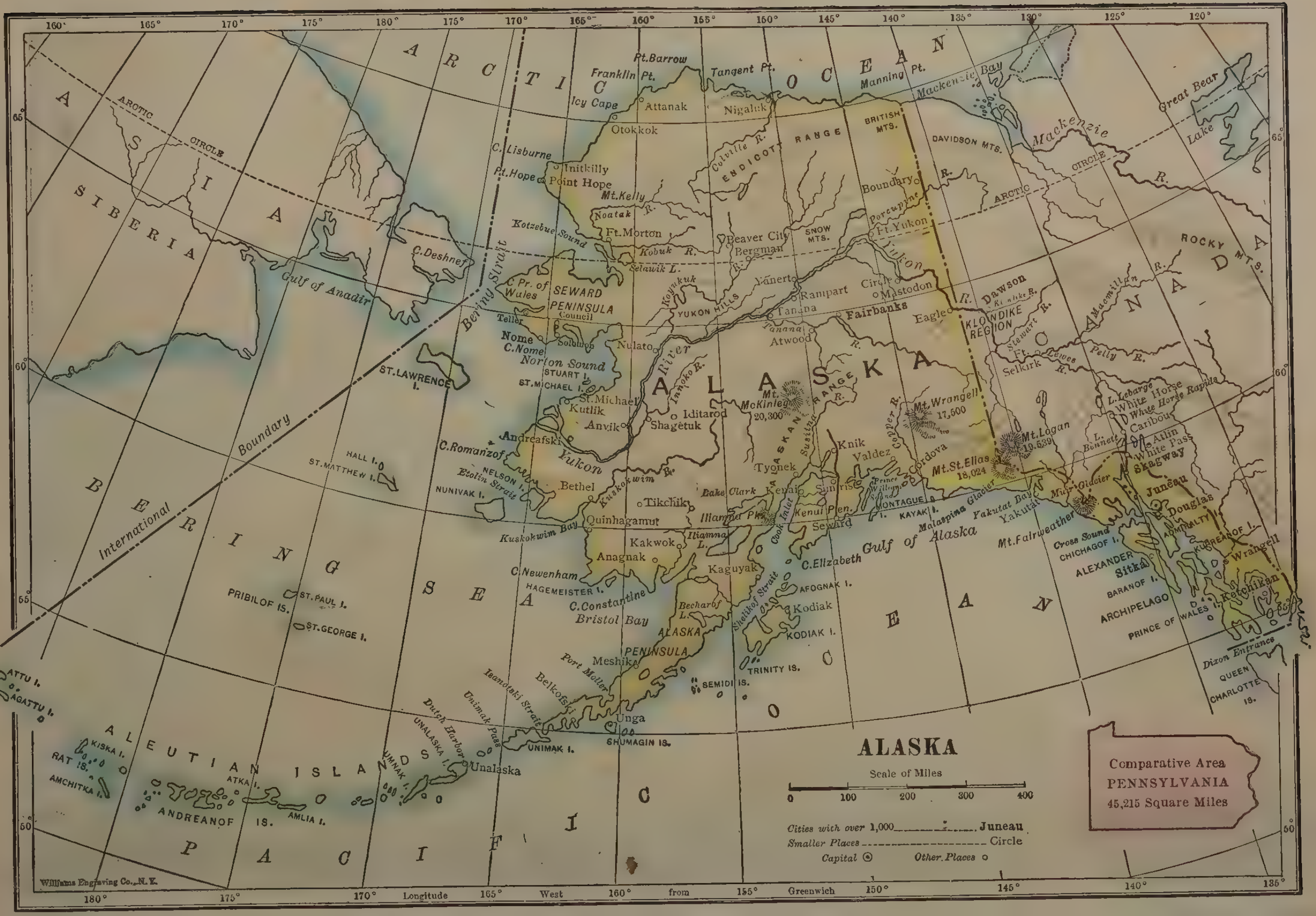

ALASKA
Scale of Miles
0
100
200
300
400
Cities with over 1,000 Juneau
Smaller Places Circle
Capital
Other Places
Comparative Area
PENNSYLVANIA
45,215 Square Miles
ARCTIC OCEAN
BERING SEA
PACIFIC OCEAN
ASIA
SIBERIA
CANADA
ALASKA
International Boundary
ARCTIC CIRCLE
Longitude West from Greenwich
Williams Engraving Co., N. Y.
Pt. Barrow
Franklin Pt.
Icy Cape
Attanak
Otokkok
Tangent Pt.
Nigaluk
Manning Pt.
Mackenzie Bay
Mackenzie R.
Great Bear Lake
DAVIDSON MTS.
BRITISH MTS.
ENDICOTT RANGE
Colville R.
C. Lisburne
Pt. Hope
Initkilly
Point Hope
Mt. Kelly
Noatak R.
Kotzebue Sound
Ft. Morton
Kobuk R.
Selawik L.
Beaver City
Bergman
SNOW MTS.
Boundary
Porcupine R.
Ft. Yukon
Yukon R.
ROCKY MTS.
C. Deshnef
Gulf of Anadir
Bering Strait
C. Pr. of Wales
SEWARD PENINSULA
Council
Teller
Nome
C. Nome
Solomon
Norton Sound
STUART I.
ST. MICHAEL I.
St. Michael
Kutlik
Anvik
Nulato
Koyukuk R.
YUKON HILLS
Yanert
Rampart
Tanana
Circle
Mastodon
Fairbanks
Eagle
Dawson
Klondike R.
KLONDIKE REGION
Stewart R.
Ft. Selkirk
Lewes R.
Pelly R.
Macmillan R.
Atwood
Tanana R.
River
Innoko R.
Iditarod
Shagetuk
Mt. McKinley 20,300
ALASKAN RANGE
Sushitna R.
Mt. Wrangell 17,500
Copper R.
Cordova
Mt. Logan 19,539
Mt. St. Elias 18,024
L. Lebarge
White Horse
White Horse Rapids
Caribou
L. Bennett
Atlin
White Pass
Skagway
Juneau
Douglas
Muir Glacier
Knik
Valdez
Tyonek
Lake Clark
Kenai
Sunrise
Prince William Sound
MONTAGUE I.
KAYAK I.
Malaspina Glacier
Yakutat Bay
Yakutat
Mt. Fairweather
Kenai Pen.
Seward
Iliamna Pk.
Iliamna L.
Cook Inlet
Gulf of Alaska
C. Elizabeth
AFOGNAK I.
Kodiak
KODIAK I.
Shelikof Strait
TRINITY IS.
SEMIDI IS.
Kaguyak
Becharof L.
ALASKA PENINSULA
Bristol Bay
C. Constantine
HAGEMEISTER I.
C. Newenham
Anagnak
Kakwok
Quinhagamut
Kuskokwim Bay
Kuskokwim R.
Tikchik
Bethel
Yukon
Andreafski
C. Romanzof
NELSON I.
Etolin Strait
NUNIVAK I.
ST. LAWRENCE I.
HALL I.
ST. MATTHEW I.
PRIBILOF IS.
ST. PAUL I.
ST. GEORGE I.
Meshik
Port Moller
Belkofski
Unga
SHUMAGIN IS.
Isanotski Strait
UNIMAK I.
Unimak Pass
Dutch Harbor
Unalaska
UNALASKA I.
UMNAK I.
ALEUTIAN ISLANDS
ATKA I.
AMLIA I.
ANDREANOF IS.
KISKA I.
RAT IS.
AMCHITKA I.
ATTU I.
AGATTU I.
Cross Sound
CHICHAGOF I.
ALEXANDER ARCHIPELAGO
Sitka
BARANOF I.
ADMIRALTY I.
KUPREANOF I.
Wrangell
Ketchikan
PRINCE OF WALES I.
Dixon Entrance
QUEEN CHARLOTTE IS.
160°
165°
170°
175°
180°
155°
150°
145°
140°
135°
130°
125°
120°
65
60
55
50

FIG. 190

30001 0,00 9 4

tained Alaska. In 1898 Hawaii was annexed as a territory and a number of other islands came into our possession. Since these lands form a part of the territory controlled by our government, a study of them may come at this point.

I. Alaska

How obtained; and how the purchase was regarded

For a long time Alaska, which is more than twice as large as Texas, belonged to Russia. In 1867 that nation sold the territory to us for $7,200,000. At the time many people thought it very unwise to pay so large a sum for so distant and desolate a land. However, it has already proved of great value, and has paid for itself many times over.

The climate

Since the Arctic Circle crosses the northern part of Alaska, it will be seen that the climate of much of the territory must be severe. The winters are long and cold, and the summers short and cool.

A strip of coast land extends southeastward from the main peninsula of Alaska, and to this the west winds bring an abundance of rain and snow (Fig. 200). Since these winds blow from the ocean, they make the winters much warmer than in the northern part of the territory.

Surface of the land

1. Extent of the mountains

A large part of Alaska is mountainous, for the mountain ranges of the United States and western Canada extend northward into this territory. Among these mountains are the loftiest peaks of the continent, the highest yet discovered being Mount McKinley, which is 20,464 feet high.

The long peninsula and the chain of Aleutian Islands, which form the southern boundary of Bering Sea, are really a growing mountain chain 1600 miles in length. Altogether there are 57 volcanoes in this chain, some of them still active; and all along the Alaskan coast earthquakes are frequent, because the mountains are still rising.

2. The scenery

The snows are so heavy that most of the mountains are snow-covered throughout the year (Fig. 201); and hundreds of glaciers descend through the mountain valleys, some even entering the sea and breaking off to form icebergs. The largest glaciers on the continent are found in this section. One of the best known of these, the *Muir Glacier*, is located not far north of Sitka.

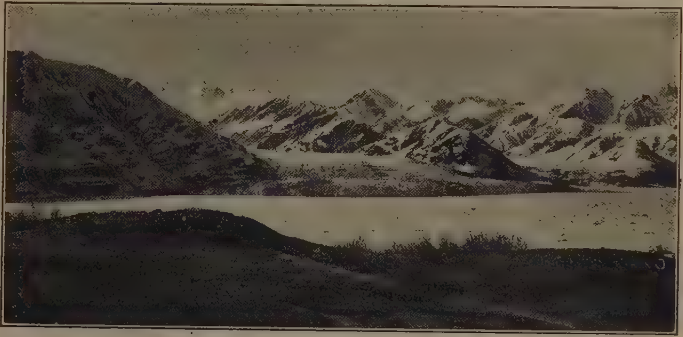


FIG. 201. — The snow-capped mountains near Mount Saint Elias, Alaska. In the middle of the picture is a glacier which descends to the sea, discharging icebergs from a cliff over a mile and a half long and 250 feet high.

There are so many islands along the coast that, for a thousand miles, the steamers sail between lofty, forest-covered mountain walls, with snow-capped peaks in the background, and upon waters whose surface is as quiet as a lake. It is one of the most wonderful ocean voyages in the world, and the reason for it is that the sinking of the land has allowed the sea to enter the branching mountain valleys, changing them to long, narrow, arms of the sea, or *fiords*, almost cut off from the ocean.

Present thriving industries

1. Fishing

(1) *Catching of food fish*

Among the resources of Alaska, as in the case of other far Northern lands, those of the sea are especially important. On the shallow banks, and along the coast, are many cod and halibut, for which vessels now go from Seattle and ports further south. These fish are caught in large quantities, some being sold even in the Eastern States.

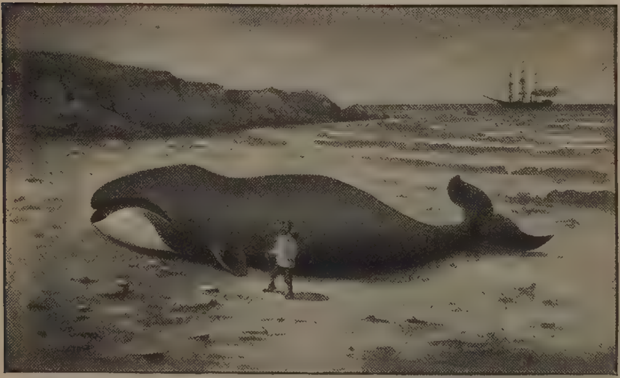


Fig. 202. — Picture of a whale, the largest of animals.

Still more important, at present, is salmon fishing. Here, as in the Columbia River (p. 127), the salmon run up the streams every summer. Sometimes the streams are almost full of these fish, all struggling to get up to the place where the eggs are laid. It is a wonderful sight to see such a salmon "run," as it is called. Immense quantities of Alaskan salmon are canned at canneries scattered along the coast. The Alaskan steamers are loaded with canned salmon every fall, taking them to Seattle or other ports, for shipment to all parts of the world.

(2) *Whaling*

Another ocean animal found in Alaskan waters is the whale. This animal (Fig. 202), which is sometimes over a hundred feet long, is really a land animal that has taken up life in the sea, as seals and walruses have done. Therefore, unlike the true fishes, which secure air from the water by means of their gills, the whale must now and then rise to the surface for air. It is when rising to breathe, or "blow," that the huge creatures are killed.

Every year steamers, specially built for the purpose, venture into the Arctic Ocean through Bering Strait in search of the whale. Few ships are now engaged in this dangerous occupation, for the whale is much less common than formerly. The ships are obliged to push their way into the *floe* ice, in which they are in danger of being crushed by the pressure of the ice, as it is moved about by the current.

Men take all these risks in order to secure the valuable whalebone that grows in the whale's mouth. This bone has a coarse, hairlike fringe on its margin which serves to strain out of the water the small sea animals on which the huge monster feeds. Another product is the blubber, or layer of fat, that lies beneath the skin and keeps the whale warm even in the waters of the frozen Arctic. This blubber is made into oil; and before kerosene was made, whale oil was much used for lights.

(3) *Sealing*

Many different kinds of seals are found along the Alaskan coast. One of these, the *fur seal*, which lives in Bering Sea, is of great value because of its soft fur, which is much used for winter coats. During the greater part of the year the fur seals swim about in search of food; but in the spring, during the breeding season, they resort to the Pribilof Islands (Fig. 203).

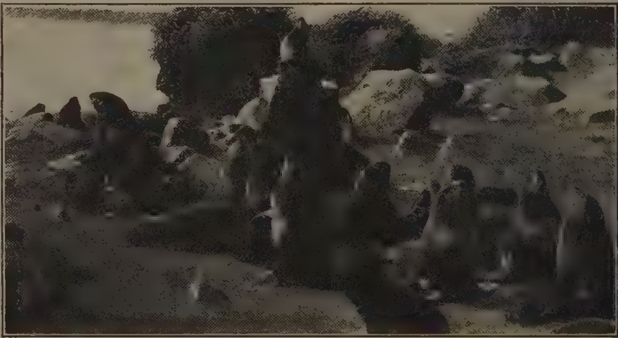


Fig. 203. — A group of fur seals on the shore of the Pribilof Islands.

The United States government prohibits all persons from killing the fur seal, except one company, which pays a special tax for the privilege of securing a certain number each year. At the proper season the men select a number of seals and drive them off for slaughter, much as sheep would be driven. There are so few of these seals, and they are so easily killed, that if the government did not protect them, all would soon be destroyed.

At present the fisheries are by far the most important of Alaskan industries. Thus far their products have amounted in value to over $150,000,000, nearly one half of which has been received for the salmon.

2. Mining

Valuable as the fisheries are, it is the minerals, especially gold, that have attracted most attention to Alaska. In 1896 rich gold deposits were discovered in the gravels of a small stream, the *Klondike*, a tributary to the Yukon River in Canada, just across the Alaskan boundary. In a single year fifty thousand men rushed to this new gold field (Fig. 204), as people did to California in 1849.

Since then gold has been found in many parts of Alaska, as at NOME, in the Tanana Valley, and elsewhere; and every year thousands of men go there. But most of them return in the fall, partly to escape the cold winter, and partly because the gravels cannot be washed when the ground is frozen. In some places, where the ground is frozen even in summer, it has been necessary to thaw it out by means of fires before the gravel could be washed. In 1910, Alaska ranked fourth in the production of gold in the Union, the value of the output being over $16,000,000 (Fig. 272).

One great difficulty has been to reach the gold fields and to carry supplies to them. The early miners were exposed to great hardships on their journey to the Klondike region. Now, however, by the help of a short railway across the mountains, one can go into the interior of Alaska much more easily. In summer many go up the Yukon River in boats; but this is impossible in winter when the river is frozen. Trace this course. How does the Yukon River compare in size with the Ohio (Appendix, p. 431)?

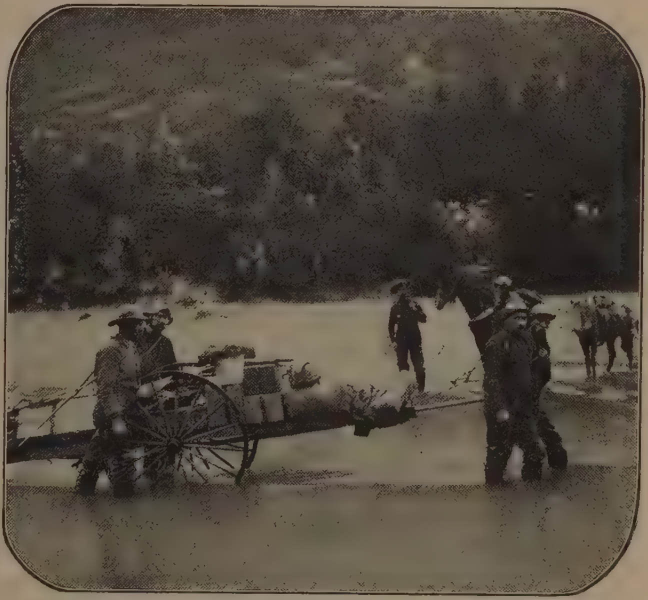


FIG. 204. — Miners fording the icy waters of an Alaskan river on the way to Klondike. Two of them are harnessed in a wagon containing their supplies.

Partly because of the difficulty of taking in supplies and machinery, there has, as yet, been little gold mining in the solid rock. There are, however, some such mines already opened, the largest being on Douglas Island near JUNEAU, where there is the largest stamp mill in the world. Nor has there been much mining of other minerals, although enormous deposits of copper and coal are known to exist in Alaska.

Prospects for the future

1. In connection with fishing and mining

No doubt the salmon industry will increase in importance in the future. This is true also of the mining. When, as at present, supplies have to be drawn in by dogs, or on the backs of men or of horses, even across glaciers and lofty mountains, the expense of transportation is very great. However, railroads are now being built to the richest gold and copper regions; and when these are finished, the amount of metal mined will be greatly increased.

2. In connection with other resources

There are other valuable resources in Alaska. Among them are the extensive forests, especially along the southeastern coast, and in some of the warmer valleys of the interior.

Although the country is very mountainous, there is much good soil; and in some places the climate is suitable to farming. Besides, even where the summers are too short for crops, grass often grows luxuriantly. It is possible, therefore, to raise sheep and cattle here, and no doubt this will some day be one of the industries of Alaska.

Reindeer also thrive in this country. On the tundras in northern Asia the reindeer is a domestic animal, supplying the people with meat, milk, and hides, besides serving as a draft animal. The reindeer has already been introduced into the tundras of Alaska, and will make it possible for people to live there much more comfortably.

There is no doubt, therefore, that Alaska will prove much more valuable to us in the future than it has thus far been.

Principal towns

In such a new country there are, of course, no large cities. The oldest and best known is the quaint town of SITKA, the former capital. JUNEAU, which was made the capital a few years ago, besides being near valuable gold mines, is on the route to the Klondike. It is, therefore, an important center. Not far north is SKAGWAY, where miners leave the steamer to take the *White Pass* Railway to the headwaters of the Yukon.

There are also many mining towns, such as DAWSON, in the Klondike region of Canada, and NOME, on Bering Sea. In 1898, the beach sands at Nome were found to contain gold, and in a single season a good-sized city had grown on the beach. Large numbers of men lived in tents, and others in rough wooden shanties. In 1900, there were over twelve thousand people here; but ten years later, there were only about one sixth as many. In such a mining district a town may grow up in a year and become deserted in a single season.

2. Porto Rico and Cuba

Their history

We have just seen that the United State has secured possession of distant Norther lands; it has still more recently come into control of some tropical islands. As a result of our wa with Spain, in 1898, Porto Rico was cede to the United States and Cuba was give its independence, under the general guidanc of the United States.

Since that time, Porto Rico has mad great advance; but Cuba has not done s well. After the war, our governmen occupied Cuba for a while, then hande over the control to the Cuban people, wh established a republican form of government But soon trouble arose, and in 1906 th United States had to interfere again. I 1909 the Cubans were again given control Cuba is not a dependency of our country as Porto Rico is, but the United States ha a right to interfere there when it seem necessary in order to preserve peace. Sinc it is thus under our protection, we are mor interested in Cuba than in other island of the West Indies, with the exception o Porto Rico; and it seems better to describ Porto Rico and Cuba together than to clas Cuba with the other West Indian Island in which we have no special interest.

Area and surface features

Cuba is the largest island in the Wes Indies, being nearly as large as Pennsylvania, although much longer and narrower. Porto Rico is somewhat smaller than Connecticut. Eac of these islands is quite mountainous, th peaks in Cuba ranging from 2000 to 400 feet above sea level, while one of the reaches an altitude of 8600 feet.

Climate

Both islands lie entirely within the tropical zone, and on the lowlands neither sno nor frost are known. On account of the warm climate many people from the United States go t Porto Rico and Cuba to spend the winter There is an abundance of rain in mos parts of the islands; but the rainfall i

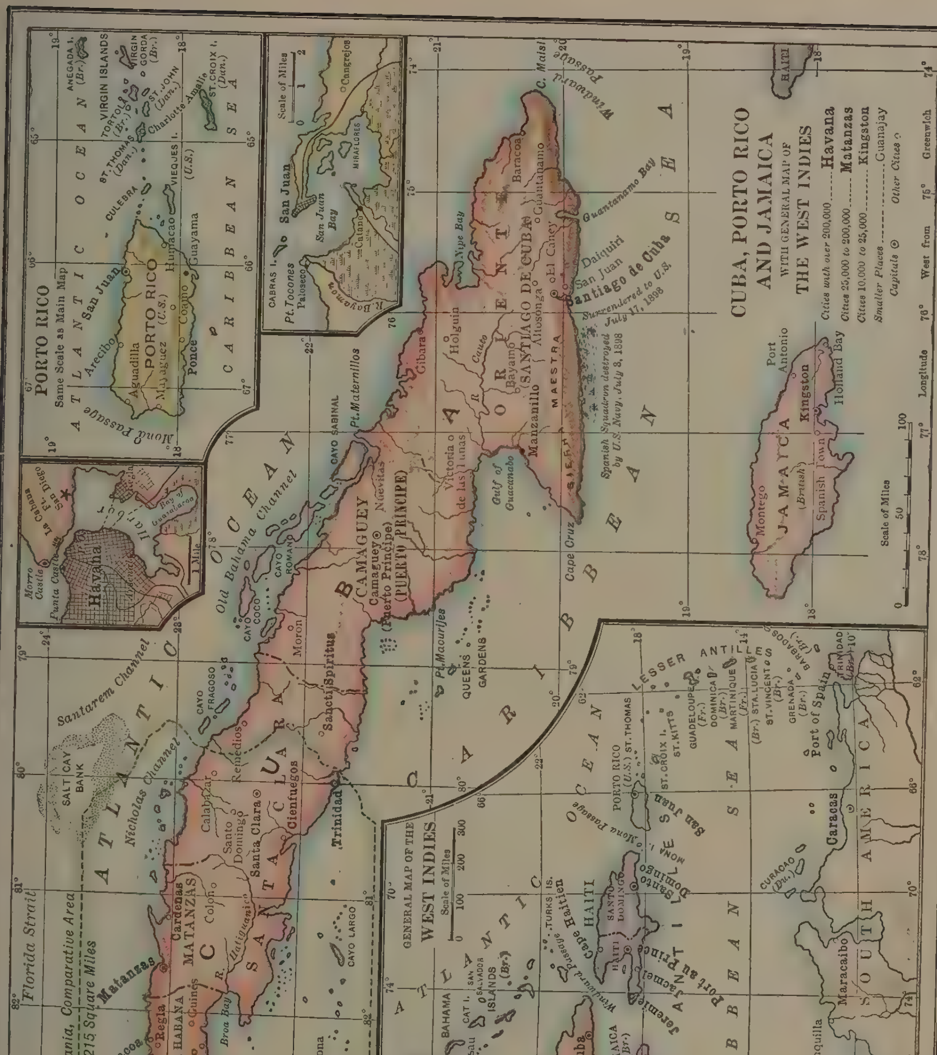

CUBA, PORTO RICO AND JAMAICA
WITH GENERAL MAP OF THE WEST INDIES
Cities with over 200,000 Havana
Cities 25,000 to 200,000 Matanzas
Cities 10,000 to 25,000 Kingston
Smaller Places Guanajay
Capitals ⊙
Other Cities ○
Longitude 78° 77° 76° 75° West from Greenwich 74°
Scale of Miles 0 50 100
PORTO RICO
Same Scale as Main Map
PORTO RICO (U.S.)
San Juan
Arecibo
Aguadilla
Mayaguez
Ponce
Coamo
Guayama
Humacao
CULEBRA
VIEQUES I. (U.S.)
ST. THOMAS (Dan.)
Charlotte Amalie
ST. JOHN (Dan.)
TORTOLA (Br.)
VIRGIN ISLANDS
VIRGIN GORDA (Br.)
ANEGADA I. (Br.)
ST. CROIX I. (Dan.)
Mona Passage
ATLANTIC OCEAN
CARIBBEAN SEA
San Juan
San Juan Bay
Scale of Miles 0 1 2
CABRAS I.
Pt. Tocones
Palaseco
Cangrejos
MIRAFLORES
Cutaño
R. Bayamon
Havana
Morro Castle
Punta Castillo
La Cabaña
San Diego
Bay of Guanabacoa
Atarés
1 Mile
Florida Strait
Pennsylvania, Comparative Area 45,215 Square Miles
GULF OF MEXICO
SALT CAY BANK
Santarem Channel
Nicholas Channel
Old Bahama Channel
ATLANTIC OCEAN
CARIBBEAN SEA
CUBA
PINAR DEL RIO
Pinar del Rio
Viñales
Guane
Consolación del Sur
Cape San Antonio
Guanajay
Havana (La Habana)
Guanabacoa
Regla
LA HABANA
Batabano
Guines
Broa Bay
Matanzas
Cardenas
MATANZAS
Colon
Hatiguanico R.
Calabazar
Santo Domingo
Santa Clara
SANTA CLARA
Cienfuegos
Remedios
Trinidad
Sancti Spiritus
Moron
CAYO FRAGOSO
CAYO COCO
CAYO ROMANO
CAYO SABINAL
Pt. Maternillos
Nuevitas
CAMAGUEY
Camaguey (Puerto Principe)
(PUERTO PRINCIPE)
Pt. Macurijes
QUEENS GARDENS
Victoria de las Tunas
Gibara
Holguin
Cauto R.
Bayamo
Manzanillo
Gulf of Guacanabo
Cape Cruz
SIERRA MAESTRA
ORIENTE
(SANTIAGO DE CUBA)
Santiago de Cuba
Altosonga
El Caney
San Juan
Daiquiri
Guantanamo
Guantanamo Bay
Baracoa
Nipe Bay
C. Maisi
Windward Passage
HAITI
Spanish Squadron destroyed by U.S. Navy, July 3, 1898
Surrendered to U.S. July 17, 1898
ISLE OF PINES
Nueva Gerona
CAYO LARGO
JAMAICA (British)
Montego
Spanish Town
Kingston
Port Antonio
Holland Bay
GENERAL MAP OF THE WEST INDIES
Scale of Miles 0 100 200 300
GULF OF MEXICO
Tampa
FLORIDA
Key West
Florida Strait
Havana
CUBA
Santiago de Cuba
BAHAMA ISLANDS (Br.)
Nassau
ANDROS ISLANDS
CAT I.
SAN SALVADOR
TURKS IS.
Windward Passage
Cape Haitien
HAITI
SANTO DOMINGO
Port au Prince
Jacmel
Jeremie
Santo Domingo
JAMAICA (Br.)
Kingston
MONA I.
Mona Passage
PORTO RICO (U.S.)
San Juan
ST. THOMAS
ST. CROIX I.
ST. KITTS
GUADELOUPE (Fr.)
DOMINICA (Br.)
MARTINIQUE (Fr.)
STA. LUCIA (Br.)
ST. VINCENT (Br.)
BARBADOS (Br.)
GRENADA (Br.)
TRINIDAD (Br.)
Port of Spain
GREATER ANTILLES
LESSER ANTILLES
CARIBBEAN SEA
ATLANTIC OCEAN
CURAÇAO (Du.)
Caracas
Maracaibo
Barranquilla
SOUTH AMERICA
Panama
Colon
PANAMA CANAL
Isthmus of Panama
PANAMA
COSTA RICA
San José
Lake Nicaragua
NICARAGUA
Managua
HONDURAS
Tegucigalpa
CENTRAL AMERICA
Gulf of Honduras
Belize
MEXICO
C. Catoche
Yucatan Channel
Williams Engraving Co., N.Y.

FIG. 205.

especially heavy on the northeastern, or *windward*, slopes, where the damp winds, which blow from the northeast, first reach the land. The summer is the rainiest season, for then the winds blow with greatest strength and steadiness.

Agriculture

While there are mountain ranges in each of the islands, a large portion of Porto Rico and Cuba has been cleared and cultivated. This is especially true of Porto Rico, which is really an island of farms. Crops grow luxuriantly partly because of the excellent soil, and partly because of the favorable climate. Indeed, agriculture is the chief industry on both islands.

1. The farm products

As in all the West Indies, the principal crop is sugar cane (Fig. 207), and the industry is carried on much as it is in Louisiana (p. 75). A second important crop is tobacco, for which Cuba is especially noted. Tobacco is also raised extensively in Porto Rico. At HAVANA, and other places, it is manufactured into cigars, which bring high prices, — the Havana cigar being considered the best that is made.

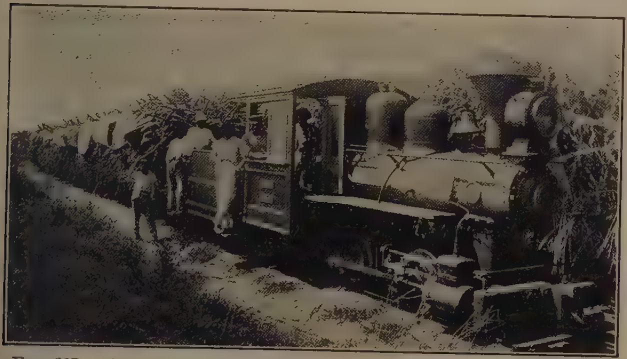


FIG. 207. — A train on a sugar plantation in Porto Rico drawing the sugar cane to the sugar mill.

Upon the hillslopes much coffee is produced, and some tea and cocoa. Spices, including nutmeg, cinnamon, and ginger, are products of the West Indies; also pepper, cardamom, vanilla, and pimento or allspice. Such fruits as bananas, oranges, limes, pineapples (Fig. 208), and cocoanuts are grown in great quantities; and there are also many vegetables. There is much pasture, too, and many cattle are raised.

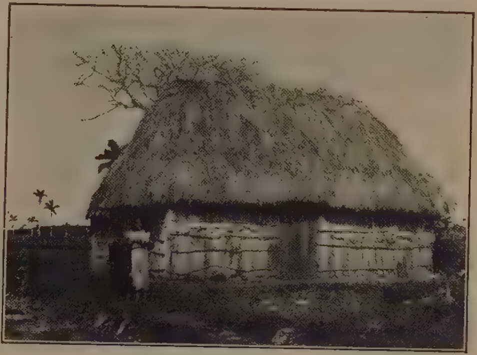


FIG. 206. — A native hut in Cuba.

2. Their special value to the United States

Our soil and climate have enabled us to raise almost all the farm products that we have needed, except such as may be produced within these islands. They can send us tea, coffee, sugar, spices, and tropical fruits. They can also send us fruits and vegetables in midwinter. Thus it is of great value to us that we have such close relations with these islands.

Other raw products

When first settled, the West Indies were covered by a dense tropical forest, and some of the woods still remain, especially among the higher mountains. In Cuba, for instance, there is still much valuable timber, such as mahogany, ebony, and fustic, which produces a valuable yellow dye.

Besides the raw products of the soil, there is some mineral wealth in Cuba. Copper is found here, and also iron, the latter having been mined for a long time in the neighborhood of SANTIAGO.

Railways connect some of the cities, and also reach out into the agricultural districts,

Conveniences for transportation

thus serving to bring the crops to the chief ports for shipment. However, many of the towns are not connected by rail; and since there are few good wagon roads, they have almost no communication with the outside world, except by boat.

During its occupation of Cuba, the United States has had one good macadam road built from the eastern to the western end of the island. Steamboat lines now run from American ports to Havana and other West Indian ports. Thus the United States has done much to improve the conveniences for the transportation of goods; and by that means a much better market is secured for the products of these islands.

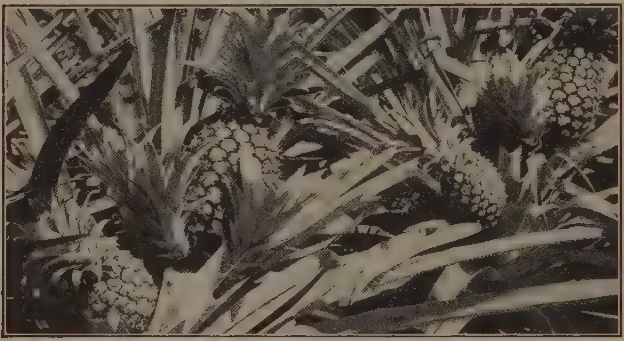


FIG. 208. — Pineapples growing in Porto Rico.

Principal cities

Owing partly to lack of coal, and partly to the bad government of the Spaniards, there has been very little manufacturing. There are, however, several important cities along the coast. The largest of these is HAVANA, in Cuba, for a long time the center of the Spanish rule in America. Another Cuban city is SANTIAGO, where the Spanish ships were sunk in the war of 1898; and a third is MATANZAS.

The two principal cities of Porto Rico are SAN JUAN, on the northern coast, and PONCE, on the southern. The former is the largest city and capital of the island.

Inhabitants of the Islands

Portions of Porto Rico and Cuba are densely populated, although in Cuba's wars with Spain thousands upon thousands were killed in battle or starved to death. Much property was destroyed, and altogether the island was so badly governed that it will be many years before a full tide of prosperity returns.

Many of the natives are of mixed blood. The Indians did not prove good slaves to their Spanish conquerors, and negro slaves were brought from Africa. Therefore, while pure-blooded Spaniards are numerous, many of the inhabitants of Porto Rico and Cuba are negroes, either full blooded or half-breeds. Under Spanish rule these natives were very poor and densely ignorant; but they are capable of advance under proper guidance.

3. Panama Canal Zone
(Fig. 209)

Its location and extent

One of the most interesting regions controlled by the United States is the Panama Canal Zone, a strip of land and water about fifty miles long and ten miles wide. This zone extends from the Caribbean Sea across the isthmus into the Pacific Ocean. It includes some other land in the vicinity of the canal and the islands in the Bay of Panama. According to a treaty between the United States and the Republic of Panama, the government of this zone is placed under the control of the United States for an unlimited time.

Its cities and ports.

At the entrance to the Canal, on the Caribbean Sea, is located the city of COLON, formerly called Aspinwall. It is a city with large shipping docks and well-paved streets. The shipping business is very important. French, German, English and American passenger boats call here regularly, and freight vessels from many nations are daily seen at CRISTOBAL, the port just at the entrance to the Canal.

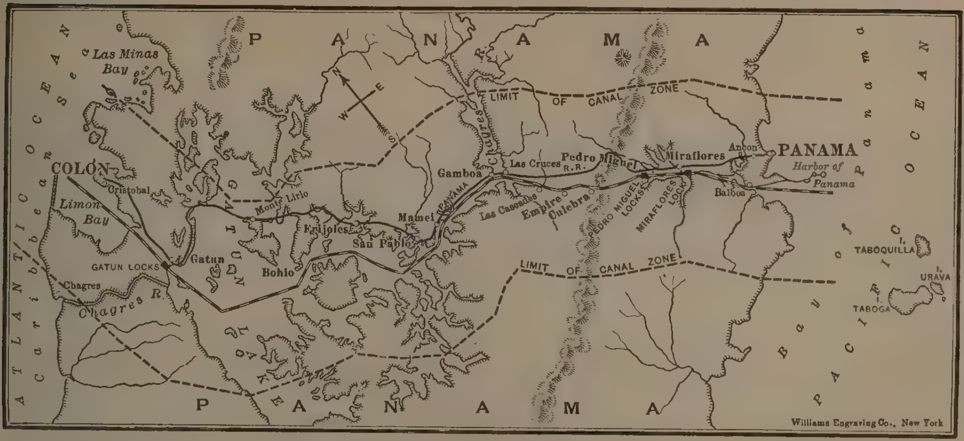


FIG. 209. — Map of Panama Canal Zone.

PANAMA, across the isthmus, at the south end of the Canal Zone, but only two hours away, is a splendid city of old fortifications, monuments, and churches. It is the central market for most of the native products and the distributing point for the entire isthmus. Near the city, at the entrance to the Canal, is PORT ANCON, where the large ocean-going vessels and other ships engaged in foreign commerce are accustomed to call as they enter the Canal.

The cities of Panama and Colon are under the government of Panama, but the United States government has the right in both cities, as well as in the Canal Zone, to make provision for the health of the inhabitants.

These two cities are also connected by the Panama Railroad, a work which was begun about 1850, and, after much hardship, completed nearly five years later. When the canal was built it was necessary to remove this railroad and rebuild it.

The Canal itself is a magnificent public work. Its channel is broad and deep, and from 300 to 500 feet wide at the bottom. It has huge locks 110 feet wide and 1000 feet long, arranged in pairs so as to provide for vessels going in either direction. The Canal also passes through two large artificial lakes, one of them over thirty miles long, made by a dam across the Chagres River; and through a tremendous cut in the hills at Culebra.

4. The Hawaiian Islands (Fig. 214)

Their location and mountainous character

Far out in the mid-Pacific, not quite a third of the distance from our western coast to the Philippine Islands, is a mountain chain fifteen hundred miles long, most of which lies beneath the ocean. Several large volcanic peaks rise above the water, forming a chain of Islands, known as the Sandwich, or Hawaiian, Islands. The largest of these islands is Hawaii, which is nearly as large as Connecticut. Each of the islands is made chiefly of melted rock, or lava, which has risen from within the earth (Fig. 210). Two of the Hawaiian volcanoes are still active, and the fiery hot lava flows out from them every few years. The larger, Mauna Loa, rises nearly fourteen thousand feet above the sea.

Their climate

The latitude of the Hawaiian Islands (Fig. 2) is about the same as that of Cuba and Porto Rico. Being in the midst of the broad Pacific, and therefore surrounded by warm ocean water, the climate is warm and equable. From day to night, and even from summer to winter, the thermometer varies only a few

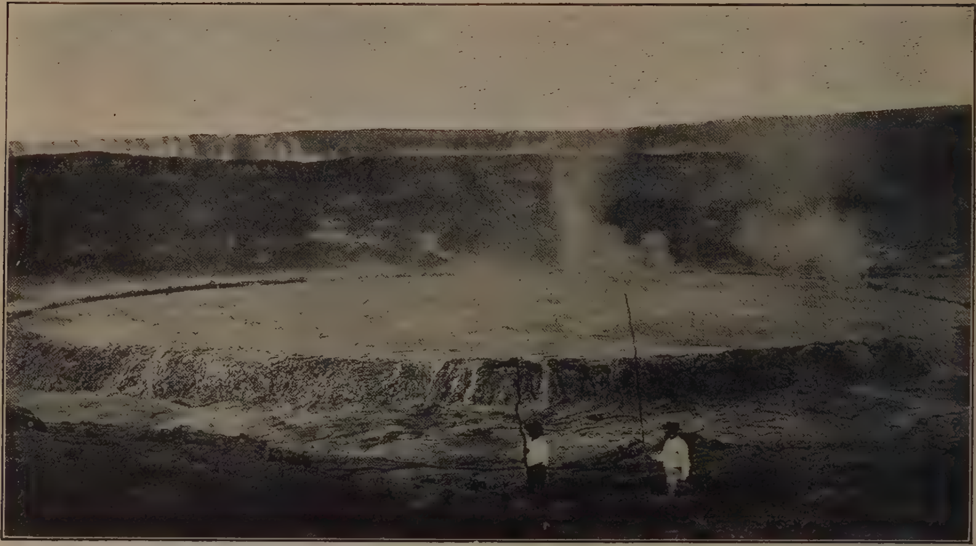


FIG. 210. — The "Lake of Fire" in the crater of one of the Hawaiian volcanoes. This is red hot lava, or melted rock, that rises from within the earth.

degrees. As in the West Indies, the northeast winds blow steadily and bring an abundance of rain to the windward slopes. The southwestern, or *leeward*, slopes are much drier, and in some places even arid.

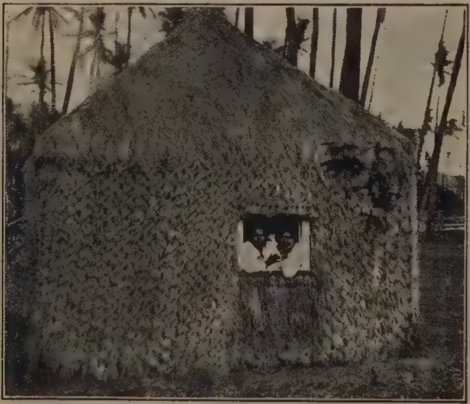


FIG. 211. — The grass hut of a native in the Hawaiian Islands.

People, industries, and chief cities

The Hawaiian natives, who are Malayans, are an intelligent race, resembling those of other Pacific islands. The Chinese form a large part of the foreign population; but there are also many Japanese, Portuguese, and Americans.

In 1893, the ruler, a native queen, was deposed, and the white population set up an independent government and offered the islands to the United States, as a territory. After some delay the offer was accepted, and the islands have been under our control since 1898.

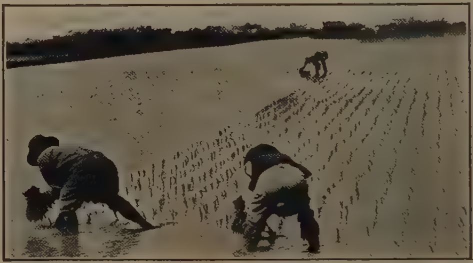


FIG. 212. — Natives planting rice in a flooded field in the Hawaiian Islands.

Many years ago white men introduced the crops of the Old World, and the larger islands have become quite productive, the principal crop being sugar (Fig. 213). Coffee, tropical fruits, and rice (Fig. 212) are other products, the last being cultivated especially by the Chinese.

The two leading cities are HONOLULU, on the island of Oahu, and HILO, on Hawaii.

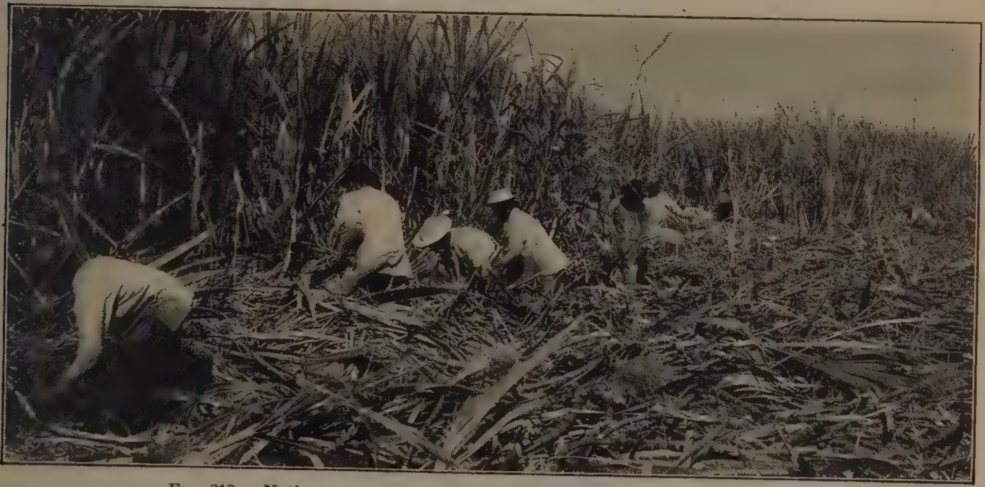


FIG. 213. — Natives cutting sugar cane on a plantation in the Hawaiian Islands.

Value of the islands to the United States

The Hawaiian Islands were one of the principal sources of food for the early Californian miners; and great quantities of raw sugar are now brought from the islands to be refined on the Pacific coast (p. 139). San Francisco has long been the chief market place for the products of these islands.

The territory has another and still greater value. During our war with Spain the islands were used as a coaling station for our war ships bound to the Philippine Islands, which then belonged to Spain. The distance from San Francisco to the Philippines is more than seven thousand miles. If we wish to send a war ship there from the Pacific coast, it is important that it find a place, on the way, at which it can obtain coal. Such a ship might carry, perhaps, eight hundred tons of coal; but as from sixty to seventy tons may be burned each day, this supply would last less than two weeks, while the voyage requires more than three weeks. Therefore the government needs to have a place along the route where it can store large quantities of coal.

Coaling stations are also wanted for passenger and freight steamers; and there is need of a place where all kinds of ships can stop for repairs. All large naval powers have such stations in various parts of the ocean. Great Britain, the greatest power upon the sea, has them in all parts of the world.

5. Other Small Island Possessions

Samoa

For a number of years the United States, Germany, and England had control over the Samoan Islands, far to the southwest of the Hawaiian Islands (Fig. 214). This arrangement did not prove satisfactory, and now *Tutuila*, one of the islands, is owned by the United States. It is of little value to us except for the coaling station at the harbor of *Pago Pago*. APIA, the chief city in the Samoan Islands, is on the island of Upola, which belongs to Germany.

Guam

As one of the results of the war with Spain, we obtained the island of *Guam* (Figs. 417 and 214), one of the Ladrones, or Robbers' Islands, some distance east of the Philippines. Like Tutuila, Guam is of little service to us except as a coaling station for vessels.

Other islands

Our country has obtained possession of several other small islands in the Pacific. Among these are *Marcus Island*, northeast of Guam; *Wake Island*, between Guam and the Hawaiian Islands; *Midway Islands*, northwest of the Hawaiian Islands; and two small islands, *Baker* and *Howland*, nearly on the equator south of the Midway Islands. None of these are of special importance.

6. The Philippine Islands (Fig. 214)

How acquired

During the Spanish War, Admiral Dewey destroyed the Spanish war ships in the harbor of Manila, and took possession of the Philippine Islands for the United States. At the close of the war we paid Spain $20,000,000 to give up all claim to them, and since then they have formed a part of our territory.

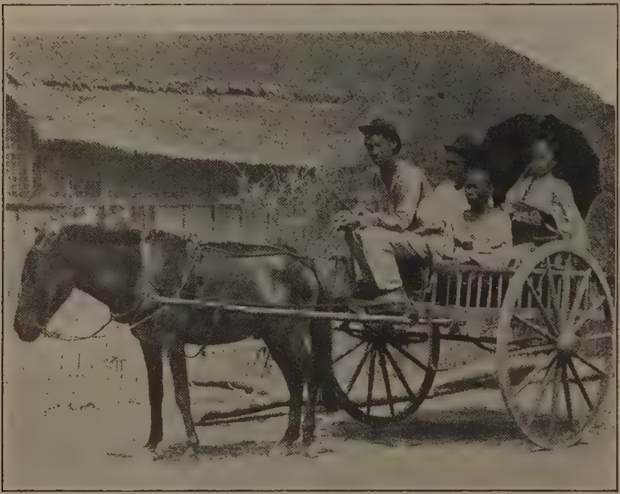


Fig. 215. — A family of Filipinos, or natives of the Philippine Islands belonging to the Malay race.

Surface features

This group of islands, or archipelago, consists of more than three thousand islands, many of which are very small. The largest, Luzon, is about the size of Kentucky; and the second, Mindanao, is almost as large.

Like the West Indies and the Hawaiian Islands, the Philippines are portions of mountain ranges in the sea. This mountain chain is still growing, and as the rocks slowly move and break, earthquake shocks are caused. Some of them have been very destructive; for instance, the earthquake of 1863 destroyed a large part of Manila. Volcanoes, some of which rise to a height of eight thousand to ten thousand feet, are numerous here, and some of them are very active.

While parts of the islands are mountainous, there are many valleys in which the soil is deep and fertile, being formed by the decay of lava, limestone, and other rocks rich in plant food.

Since none of the islands are very large, there can be no great rivers. Still, there are some with deep mouths, making good harbors; and steamboats are able to navigate the lower portions of all the larger rivers.

Climate

As in the West Indies, the climate of the Philippines is tropical — always warm, and sometimes very hot, especially at a distance from the sea.

The year is divided into the dry and rainy seasons, the former coming during the winter months, the latter in the summer. The dry period lasts as long as the winds blow from the northeast, and then the fields often become parched and cracked, and the roads very dusty. In the summer, however, the winds change to the southeast. They are then so damp that there is a deluge of rain which changes much of the country to a swamp, making travel almost impossible.

The climate, on the whole, is so damp that there can be no cellars under the houses, for they would be too wet to be healthful (Fig. 216). Indeed, the houses themselves are usually raised above the ground, and the family lives in the second story. The lower part is often used for storage, as a cellar is in our country.

Vegetation and animal life

Forests cover a large part of the archipelago, for trees thrive here, often forming a tropical jungle. Among the valuable woods are ebony, the rubber tree, from which gutta percha is obtained, and a palm from whose

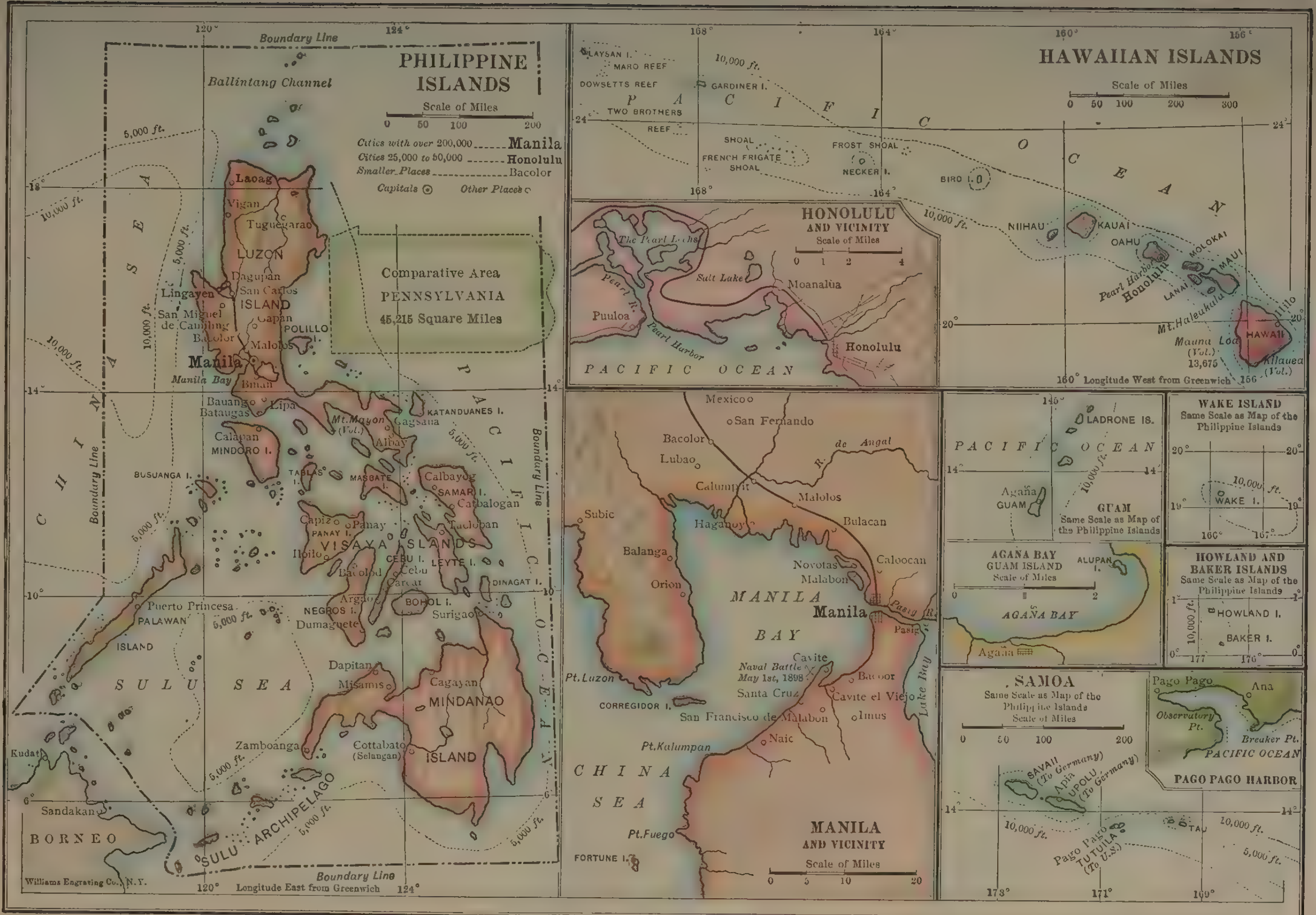


FIG. 214.
United States' Dependencies in the Pacific.

sap alcohol may be made. Cinnamon, cloves, and pepper grow in these islands, and cocoanut and banana trees are also very common.

As in other tropical forests, there are immense numbers of animals, especially insects, serpents, and beautiful birds. Among the serpents are the huge python and the deadly *cobra de capello*. There are also deer, apes, wild hogs, wild buffaloes, huge bats, and man-eating crocodiles.

Inhabitants

The inhabitants of the Philippines number over eight millions, about six-sevenths of whom are civilized. Two very different races occupy the islands, — (1) the aborigines, or original inhabitants; and (2) the *Malays* (Fig. 215). The former, a race of small, dark-skinned savages, are called *Negritos*, a Spanish word meaning little negroes. They have been forced to retreat to the forests by the more powerful and intelligent Malays. Besides the Negritos, the Malays, and the half-breeds, many Chinese traders and Spaniards live on the islands; and now there are also many Americans.

Principal products

Under the rule of the Spaniards, the more civilized tribes cleared the land and engaged in farming. Their wants are few, however, and very little work supplies them with what they need. Cocoanuts and bananas are easily obtained, and rice, yams, and other food plants may be easily raised. There is, therefore, no special reason for working hard; and, in fact, in that warm, humid climate hard work is almost impossible. Many of the natives, however, are industrious and produce more than they need for themselves.

The leading exports are hemp, sugar, tobacco, and copra. Of these, hemp is the best known. It is produced from the fibre of the wild plantain, which is much used in rope making. Rope of an excellent grade, called Manila rope, is manufactured in Manila. Knotted hemp is another form in which hemp is exported. It is made by the natives, who tie long fibres together so as to form thread or yarn.

Refined sugar (Fig. 255) has displaced raw sugar as an export. With the establishment of sugar mills on the island it became possible to reorganize the sugar industry and to produce sugar of a superior grade.

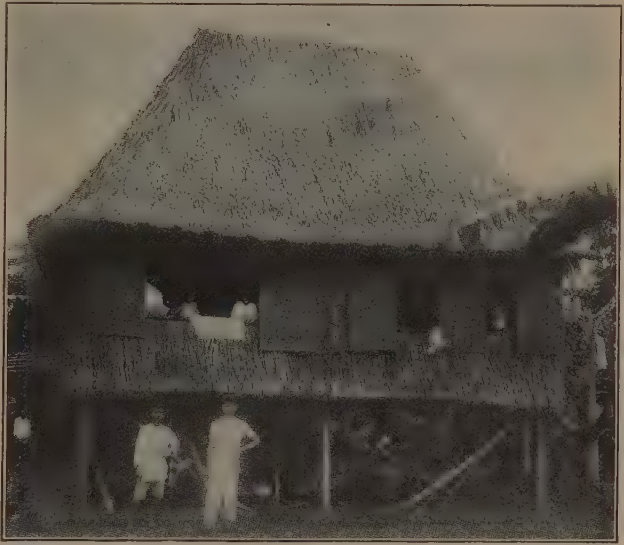


Fig. 216. — A native house in the Philippine Islands built of bamboo and covered with a thatch roof. Because of the dampness the houses do not rest on the ground.

Cigars, many of which are made in Manila (Fig. 217), are the most important tobacco export.

Copra, the dried meat of the cocoanut, is now exported in large amounts. The cocoanuts are raised in great quantities in the interior of the country and are then shipped down the river in rafts to the cities to be dried. The copra from these nuts is sent to Europe, where it is used in soap making. The oil obtained from them is used in place of lard and kerosene.

One of the most remarkable plants is the rattan, which the natives put to a thousand uses, such as making ropes, houses, canoes, frames, carts, beds, and chairs. Many of the natives make a living by splitting and marketing the cane. The bamboo is also of great value. This plant grows from one inch to eighteen inches in diameter, and from five to seventy feet in height. It is used in making the frames, sides, and even the roofs of houses, and also rafts, boats, agricultural implements, bows, bowstrings, arrows, spoons, forks, and many other articles.

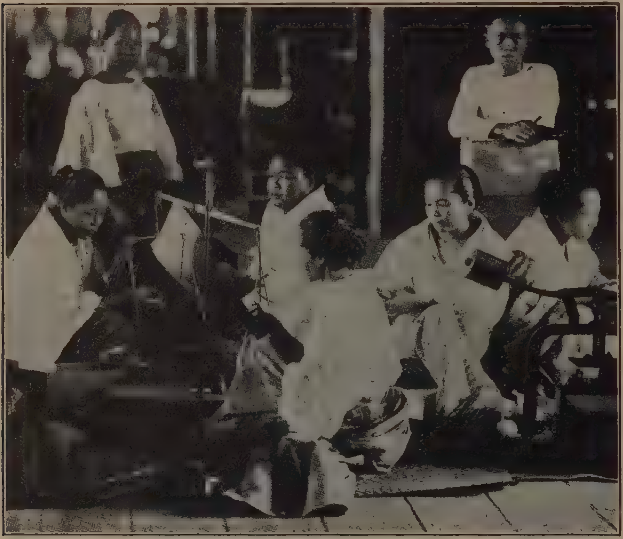


Fig. 217. — Native women of the Philippine Islands making cigars in Manila.

The natives have domesticated a native wild animal, the water buffalo (Fig. 218), which is of much value as a draft animal. It is of special service in the rice fields, which are kept flooded during the growing season. The buffalo is quite at home in the mud, even preferring wet walking to dry; and in fact, it must have a daily plunge in the mud and water.

Cities

In the entire group of islands, there are many cities having a population of more than ten thousand; but there is only one of special importance. This is Manila, on the island of Luzon. This city, which has over two hundred thousand inhabitants, is situated upon an excellent harbor, and was for a long time the center of the Spanish government in the Philippines. It is still the center of government in the archipelago.

Probable future progress

Under Spanish rule large portions of the islands were left in a wild state; and little attempt was made to use the resources to their fullest extent. The islands are able to produce far more farm products than at present. The riches of the forests have been little used; and the minerals, including gold, silver, coal, petroleum, marble, and sulphur, have likewise been largely neglected.

There is a promising future in the development of these resources, and the civilized natives are already helping greatly in the work. Many of them are educated and cultured, living in excellent homes. They are now partly governing themselves, having a legislature of their own; but the United States still holds control. We are helping to educate the people, and to establish a good government.

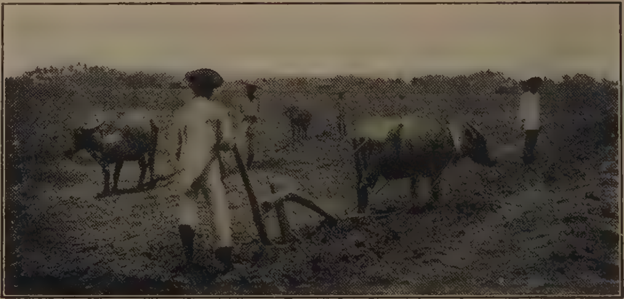
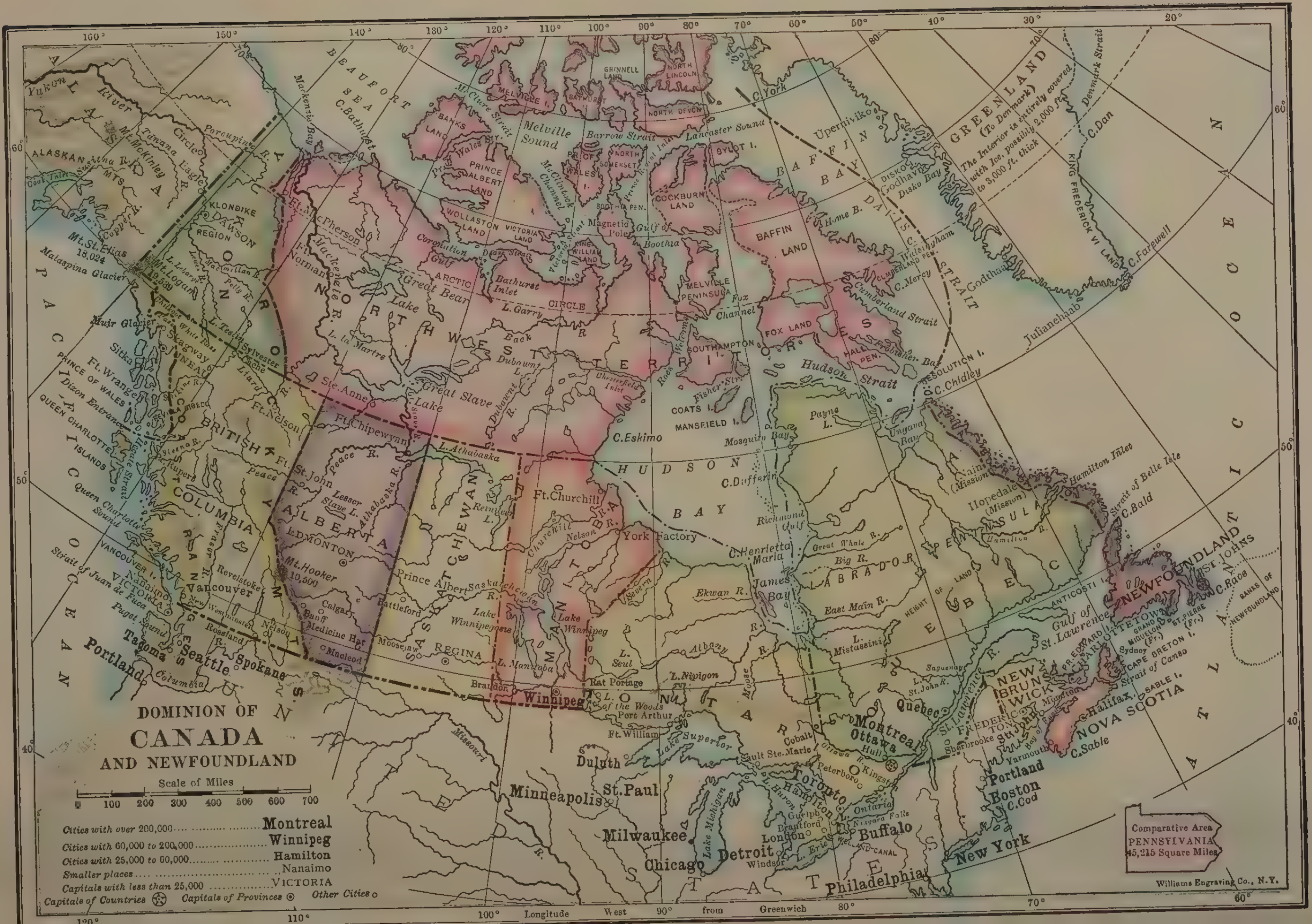


Fig. 218. — Native Filipinos plowing with the buffalo.

Alaska: Questions. 1. How was Alaska obtained, and how was the purchase at first regarded? 2. Describe the climate. 3. What are the prin-



DOMINION OF

CANADA

AND NEWFOUNDLAND

Scale of Miles

0 100 200 300 400 500 600 700

Cities with over 200,000	**Montreal**
Cities with 60,000 to 200,000	**Winnipeg**
Cities with 25,000 to 60,000	**Hamilton**
Smaller places	Nanaimo
Capitals with less than 25,000	VICTORIA

Capitals of Countries ✪ *Capitals of Provinces* ⊙ *Other Cities* ○

Comparative Area PENNSYLVANIA 45,215 Square Miles

Williams Engraving Co., N.Y.

cipal surface features? 4. What can you tell about the scenery? 5. What about the food fish there? 6. State the principal facts about the whaling. 7. The sealing. 8. The mining. 9. What about the future development of the territory? 10. Name and locate the leading towns.

Review Questions and Suggestions

SUGGESTIONS. 11. Collect some whalebone. 12. How does the area of Alaska compare with that of the United States proper? 13. Measure the length of the Yukon, and compare it with the Mackenzie. 14. Draw an outline map of Alaska.

PORTO RICO AND CUBA: QUESTIONS. 15. Give some facts in their history. What is our relation to Porto Rico? To Cuba? 16. What are their areas and principal surface features? 17. Describe the climate. 18. Name the farm products. 19. How are these products of special value to the United States? 20. What other raw products are found? 21. What about the conveniences for transportation? 22. Name and locate the principal cities. 23. What about the inhabitants of the islands?

SUGGESTIONS. 24. Estimate the length and the average breadth of Cuba. 25. What products of Cuba and Porto Rico are also raised in the United States? Where? 26. State some advantage that Cuba enjoys over Louisiana in the production of sugar. 27. Make a sketch map of Cuba and Porto Rico.

PANAMA CANAL ZONE: QUESTIONS. 28. Locate this zone. 29. How was this strip of land obtained, and what is its extent? 30. What advantages have been secured by the canal?

SUGGESTIONS. 31. What difficulties were caused by the climate in the work of digging the canal? 32. Read magazine articles telling about the work.

THE HAWAIIAN ISLANDS AND OTHER SMALL ISLANDS: QUESTIONS. 33. Where are the Hawaiian Islands located? 34. What are their surface features? 35. Describe their climate. 36. State the principal facts about their inhabitants, industries, and principal cities. 37. What is the special value of these islands to the United States? 38. Name and locate other island possessions. 39. How are they important?

SUGGESTIONS. 40. Why should you expect much the same products in the Hawaiian Islands as in Cuba? 41. Why is not the summer very hot in these tropical regions? 42. What city on our eastern coast should be associated with San Francisco as important for refining sugar? 43. Explain the presence of many Chinese and Japanese in these islands.

THE PHILIPPINE ISLANDS: QUESTIONS. 44. How were these islands acquired? 45. Describe their surface features. 46. Their climate. 47. What vegetable and animal life is found here? 48. State the chief facts about the inhabitants. 49. What are the principal products? 50. What about the cities? 51. Explain the possibilities for progress in these islands.

SUGGESTIONS. 52. Compare the latitude of the islands with that of the West Indies and of the Hawaiian Islands. 53. Name several other places thus far studied that have volcanoes. 54. Collect pictures of scenes in the Philippines. 55. Obtain a piece of Manila hemp rope for the school collection; also a piece of bamboo and of rattan. 56. Find out about Dewey's capture of Manila. 57. Make a sketch map of the islands.

General Review Questions

58. Name the principal dependencies of the United States. 59. Locate each on the map of the world (Fig. 2). 60. Walk toward each. 61. Name the principal products of each. 62. In what zones does each lie? 63. How did we obtain each? 64. Name and locate the principal cities in our dependencies.

V. COUNTRIES NORTH OF THE UNITED STATES

1. Canada and Newfoundland

Map Study

1. Trace the boundary line between United States and Canada. 2. Which of our states border on Canada? 3. What has caused so many lakes in the Dominion? 4. Name and locate the eight largest (including the Great Lakes). 5. Name and locate the four largest rivers. Into what ocean does each drain? 6. Where are the largest cities? 7. What are the names of the largest? 8. What reasons can you see for their location? 9. Trace the Arctic Circle across Canada. 10. Compare the latitude of Labrador with that of England. 11. Locate the Gulf of St. Lawrence; Hudson Bay; Greenland; Newfoundland; Nova Scotia. 12. Name the divisions of Canada.

With the exception of Alaska almost all of the land north of our country belongs to Canada.

History

1. Contest between English and French, and the result

While the British were founding the thirteen colonies, the French occupied the coast of eastern Canada and made settlements at Quebec, Montreal, and other points along the St. Lawrence Valley. Even now a very large majority of the inhabitants of the Province of Quebec speak French as their mother tongue. The French and English were often at war; but finally England, aided by her colonies, won control of the French possessions north of the

United States. Only the small islands of *Miquelon* and *St. Pierre* were retained by France, and they are still used by the French as fishing stations.

2. Name of the Union, and the provinces that make it

After our Revolutionary War, Canada still remained in possession of Great Britain. At first there were several colonies with separate governments, though all were under the control of Great Britain; but in 1867 a union was formed called the DOMINION OF CANADA. There are nine divisions, or *provinces*, in the Dominion, — Nova Scotia, Prince Edward Island, New Brunswick, Quebec, Ontario, Manitoba, Saskatchewan, Alberta, and British Columbia. Each has a government of its own, as our states have; but the united provinces have a central government with the capital at OTTAWA, which corresponds to our capital at Washington.

FIG. 220. — Lake Louise, nestled among the snow-capped mountains of western Canada, along the line of the Canadian Pacific Railway.

Besides these provinces, there are the Yukon Territory, and several undeveloped territories. The names of the latter are given on the map (Fig. 219), but they have few inhabitants and are of little importance at present. Name these divisions.

3. Newfoundland

NEWFOUNDLAND has refused to join the Dominion, so that, while still a colony of Great Britain, it is not a part of Canada. Newfoundland includes not only the island by that name, but also the east coast of Labrador.

Surface features

1. Resemblance between southern Canada and northern United States

The surface of southern Canada very closely resembles that of our Northern States. Eastern Canada, for instance, is much like New England. That section of Canada which lies north of Ohio and New York is more level, like those states; and it is the most important farming region in the Dominion. Farther west, north of Dakota and Montana, are broad plains (Fig. 226), increasing in elevation to the very base of the Rocky Mountains.

Among the Western mountains are many canyons, glaciers, and snow-capped peaks (Fig. 220). The scenery of this region is wonderful, and the Canadian Pacific Railway (Fig. 280) passes through the best of it. A portion of this wonderland has been set aside as a national park by the Canadian government.

2. Effects of the Great Glacier

The Great Glacier (Fig. 18) covered the northeastern part of Canada, for it had its source in the highlands of Labrador. As in our country, the soil of much of Canada is glacial drift; the Great Ice Sheet also formed many lakes there, and caused great numbers of rapids and waterfalls.

Climate

The climate of southern Canada, like the surface features, corresponds to that of our Northern States, though it is slightly cooler. The climate of Nova Scotia, New Brunswick, and southern Quebec, for example, resembles that of New England, while Ontario has a climate similar to that of New York, Ohio, and Michigan. Farther west, in Manitoba, we find nearly the same climate as in Minnesota and North Dakota; and west of this, in Saskatchewan and Alberta, come the arid lands. In British Columbia, on the west coast, there is heavy rainfall and an even temperature, as in Washington.

Toward the north, however, the country grows rapidly colder, until, in the extreme northern portion, the climate is frigid, and there are broad expanses of frozen tundra.

The Labrador current, which cools the temperature of New England so much (p. 33), sweeps from the Arctic Ocean past Labrador and greatly chills the coast of that region, as well as Newfoundland and Nova Scotia. There is no such ice-laden current in the Pacific, and for that reason the climate is far warmer there. Notice, for instance, how much farther north Vancouver and Juneau are than any city in eastern Canada.

Lumbering

1. Extent of the forests

The forests which cover northern New England extend into the hilly and mountainous section of New Brunswick and southern Quebec (Fig. 221). In fact, from there westward to the Pacific this wooded tract, sweeping northward around the vast plains of Manitoba, is from two to three hundred miles wide. This forest, which is one of the largest in the world, includes fully a million square miles, or over a fourth of the entire area of Canada.

In the east, the principal trees are spruce, balsam fir, pine, and maple; in the west they are spruce, mammoth cedar, sometimes sixty feet in circumference, and Douglas fir, which in some cases grows to a height of two hundred feet (Fig. 222). Most of this vast forest is a wilderness, about which very little is known. Wild animals still live here in great numbers, and there are few parts of the continent where the hunting for large game is so good. Among the animals are the deer, moose, bear, fox, wolf, wild cat, beaver, and mink. Furs are one of the principal products of the region. From very early days the Hudson Bay Company has had trading stations in this wilderness for the purpose of obtaining the furs from Indians and other hunters and trappers.

2. Method of lumbering, and lumber centers

Lumbering is carried on in much the same manner as in the northern part of the United States (pp. 33 and 125). In the east one of the rivers down which the logs are floated to the sea is the St. John. Upon this river are FREDERICTON, the capital of New Brunswick, and ST. JOHN, the largest city in that province. In these two cities the logs are made into wood pulp and lumber. Immense quantities of both these products are shipped from the seaport of ST. JOHN.

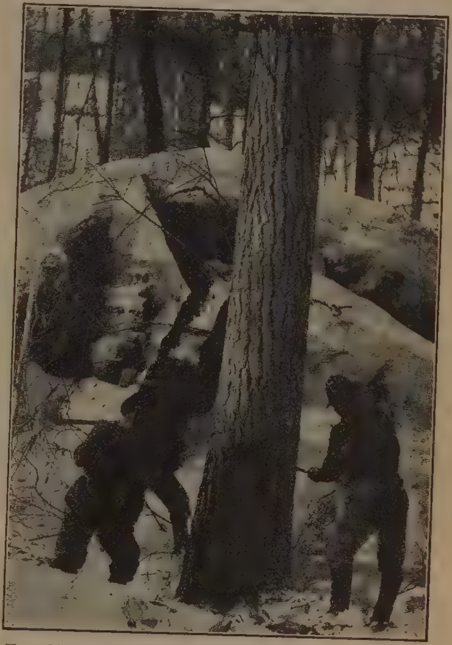


FIG. 221. — Lumbermen chopping down a tree in the forest of eastern Canada.

The woods of Canada are at present one of its greatest sources of wealth; indeed, there are hundreds of sawmills at the rapids on the streams, and even in the large cities. Among the latter, MONTREAL, TORONTO, and OTTAWA are important, especially in the manufacture of lumber into such articles as doors, blinds, barrels, and furniture.

It was the excellent fishing on the shallow banks off the eastern coast of Canada that early attracted the French to America,

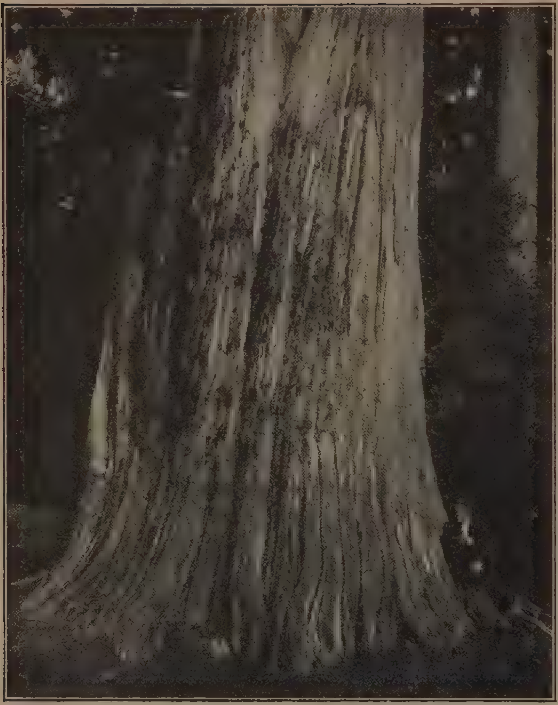


FIG. 222. — One of the large trees in the forest of western Canada. The boy sitting on the trunk gives a scale by which you can judge the size of the tree. Contrast its size with that shown in Figure 221.

Fishing

1. Catching of food fish

and fishing is still a flourishing industry along that coast. Fully fifty thousand people in Newfoundland and the eastern provinces, especially Nova Scotia and Prince Edward Island, are engaged in cod fishing. One of the best-known fishing ports is YARMOUTH, in Nova Scotia, although a great deal of fishing is carried on from HALIFAX, and other smaller places in Nova Scotia. ST. JOHN'S, Newfoundland, is another important fishing port.

There is also much inland fishing, for the streams and lakes still abound in trout, pickerel, whitefish, bass, and salmon (Fig. 223). Every year large numbers of men go from Canada and the United States to enjoy the sport of fishing in the Canadian lakes and streams. In addition, there is much fishing on the west coast, especially for salmon.

It is interesting to watch the salmon as they run up the streams to spawn. At times, in order to get beyond waterfalls, they must leap several feet into the air (Fig. 223). Sometimes they fail, but, returning to the task, they try again and again until successful. When the young have reached the proper size, they go downstream to the ocean, where they live until they are ready to spawn. It is believed that they always go back to the same river in which they were born.

While traveling up the streams, the salmon are easily caught in nets set across the current, or by dip nets in the hands of fishermen, or sometimes by salmon wheels. Immense numbers of salmon are canned in western Canada (Fig. 224), as in Washington and Alaska.

2. Sealing

We have already learned (p. 150) about the seal fishing in Alaska. Seals are also found on the eastern side of Canada, but their fur is of little value. There is, however, a layer of fat, or blubber, just beneath the skin, as in the whale. This can be made into oil, and it is mainly for the blubber that these eastern seals are caught, though the skins are also used for making leather. Vessels go out from ST. JOHN'S, Newfoundland, every spring to hunt the seals in the ice that floats down in the Labrador current (Fig. 225).

What was said about the agriculture and grazing in our Northern States applies

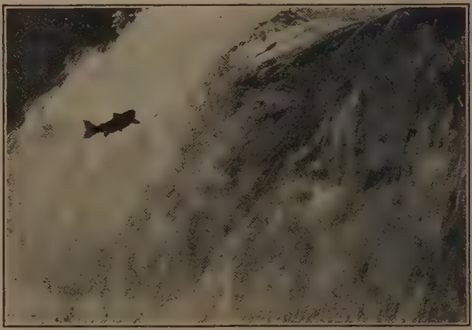


FIG. 223. — Photograph of a salmon leaping up over a waterfall in a stream on the coast of Labrador. This fall is over ten feet high and yet the salmon are able to leap up over it.

Agriculture

1. Wheat and hardy fruits in the West

almost equally to Canada. For example, the warm, damp ocean winds favor the production of wheat and the hardy fruits in British Columbia as well as in Washington (p. 127).

2. Ranching in the arid lands

Farther east, on the plains at the base of the Rocky Mountains, the climate is too arid for farming. Here, therefore, ranching is the principal industry, as in Montana and western Dakota (pp. 99 and 133). Immense herds of sheep and cattle are reared on these plains. There are several towns here, the largest being CALGARY.

3. The greatest grain region, and its leading city

In central Saskatchewan the climate begins to be more favorable for agriculture, and there, as well as in Manitoba, enormous quantities of wheat are raised. This wheat belt is a continuation of that found in Minnesota and eastern Dakota. Although the winters are long and cold, the summers are warm, so that the hardy grains, especially wheat (Fig. 226), oats, and barley, thrive.

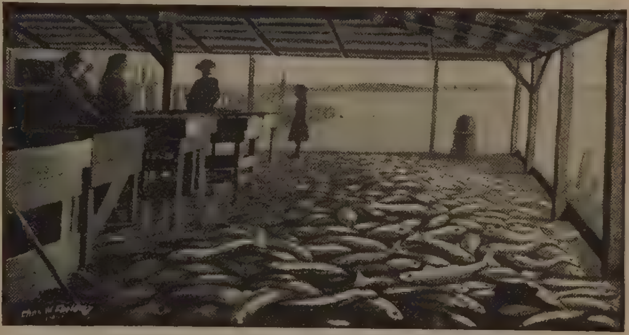


FIG. 224. — Salmon in a salmon cannery, just brought from the water.

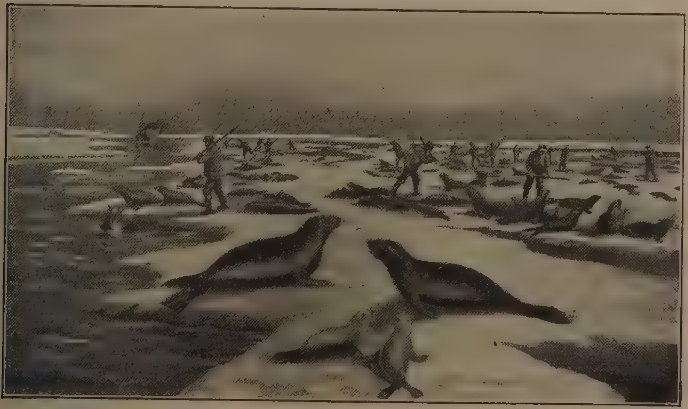


FIG. 225. — Seal hunters killing seal on the floe ice in the Labrador current north of Newfoundland.

In the midst of this wheat region is WINNIPEG, in which flour is manufactured, as in Minneapolis. This city is situated on the banks of the Red River of the North, which empties into Lake Winnipeg. Find out, from the map (Fig. 219), what other large river is tributary to this lake; also the name of its outlet.

The country north of Lake Superior is hilly and for the most part forest-covered, being quite like northern Minnesota and Michigan. There is, therefore, little agriculture here.

4. The most populous farming section, and its products

Farther east, on the peninsula between Lakes Erie, Huron, and Ontario, is some of the best farm land in Canada. This region is in the province of Ontario, which is the most populous of the Canadian provinces, containing about one third of all the people in Canada. What large cities do you find here? More than two thirds of the inhabitants of Ontario, however, dwell either on farms or in small towns in the farming districts.

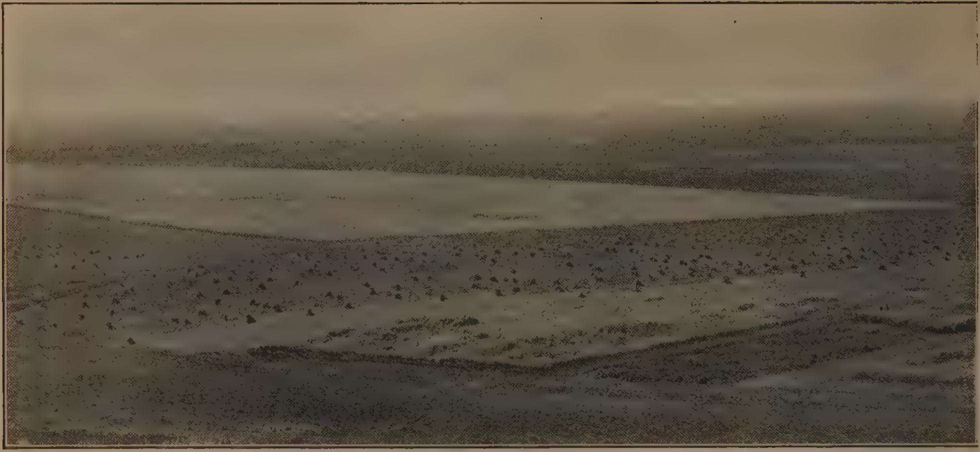


Fig. 226. — Fields of wheat, some cut, some uncut, on the level, fertile plains of southern Manitoba.

Ontario is no farther north than central and western New York; and its climate is greatly influenced by the Great Lakes. Here grapes, peaches, corn, and even tobacco are raised; also quantities of oats, wheat, barley, and flax. Some of the finest horses in America are reared in Ontario, and the province is further noted as a dairy region.

5. Farming in southeastern Canada

There is a strip of excellent farming country almost the entire length of the St. Lawrence River, and along a part of the southern shores of the Gulf of St. Lawrence. Prince Edward Island has many fine farms, and portions of Nova Scotia and New Brunswick also are farming districts. One of the best and most beautiful farming regions in all Canada is in southwestern Nova Scotia, noted especially for delicious apples. It was here that the French settlements were made, about which Longfellow has written in his "Evangeline"; and this is often called "The Land of Evangeline."

Mining

1. In British Columbia and Yukon Territory

Western Canada, like western United States, is a noted mining region. Among the minerals, gold and silver are especially important, though lead and copper ores, building stone, coal, and other mineral products are also obtained. Valuable deposits of coal are found both among the mountains and in the plains farther east. You have already learned that the famous Klondike region is situated in Yukon Territory, near the Alaskan boundary. Although so near the Arctic Circle, Dawson City, in the Klondike, has grown rapidly because of the gold mining.

2. In Ontario and southeastern Canada

Gold and silver are found in the province of Ontario, in the vicinity of the Lake of the Woods. One of the most remarkable silver deposits on the continent has recently been discovered at Cobalt, north of Toronto. Nickel is also mined in Ontario, and some oil fields have been developed.

Although iron ore has been discovered in certain places, the scarcity of coal, near at hand, has prevented Canada from producing much iron. The coal of western Canada is too distant for use in the Eastern cities, and the coal beds of the East have never been thoroughly developed. In Nova Scotia, and on Cape Breton Island, which is a part of Nova Scotia, there are extensive beds of soft coal, like that of western Pennsylvania and the Central States. This coal is shipped to the cities of the St. Lawrence Valley. A few years ago blast furnaces were erected at SYDNEY, Cape Breton Island, and an important iron-manufacturing industry has arisen there. This has increased the value of the Nova Scotia coal.

There appear to be two outlets by water for central Canada, — one by way of the St. Lawrence, the other by way of Hudson Bay. The latter is of little use, however. Explain why.

Transportation

Canada shares with the United States the advantages of navigation on all the Great Lakes, with one exception. Which is it? Fortunately for Canada, the lower St. Lawrence lies wholly within that country. But this river has some serious drawbacks. One is the ice that stops navigation in winter. A second is the presence of numerous rapids over which vessels cannot pass in going upstream. In addition, dense fogs are common in the Gulf of St. Lawrence and along the Newfoundland coast, where the damp air from the ocean is chilled in passing over the cold Labrador current (Fig. 312). On the other hand, ship canals have been built around the rapids and falls (Fig. 227), so that good-sized boats are able to go from the open ocean to the western part of Lake Superior, a distance of twenty-two hundred miles. This gives the Canadian route a great advantage over the Erie Canal route upon which only small canal boats can go.

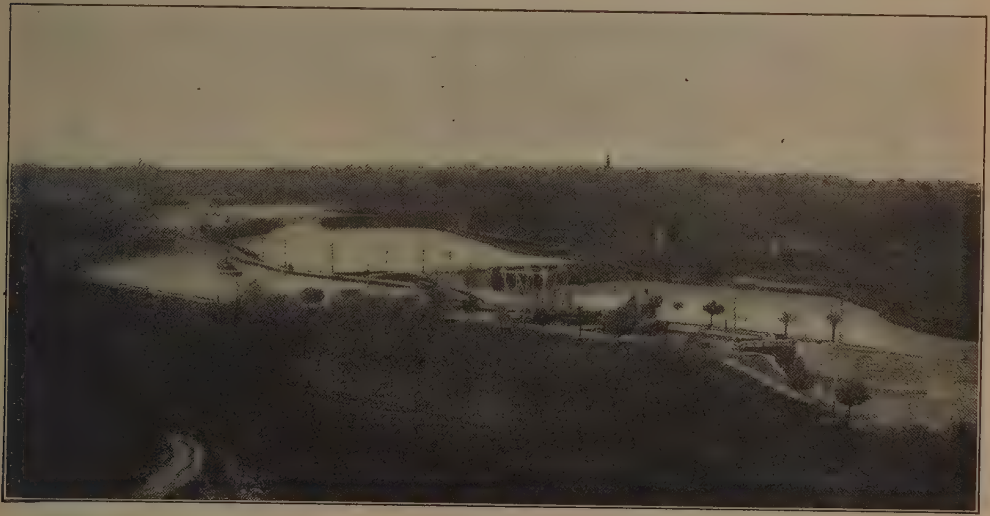


FIG. 227. — The Welland Canal, between Lakes Erie and Ontario. At this point there are two locks in the canal. Point them out. Why are they needed?

There are many other large rivers in Canada besides the St. Lawrence River. Name them, and tell why most of them are of little value.

Railways have been of great importance in Canada, as in the United States. The leading railway is the Canadian Pacific, which extends from St. John, New Brunswick, entirely across Canada, to VANCOUVER, on the Pacific coast. It is the shortest route from England to China and Japan, and much freight is sent that way. Another important line is the Grand Trunk Railway.

Leading cities

1. Along the St. Lawrence and Ottawa rivers

MONTREAL (Fig. 228), the principal city in Canada, is on the St. Lawrence River (Fig. 229), at the mouth of the Ottawa River, and just below the Lachine

Rapids. Thus goods from Europe may be carried by ocean vessel to Montreal, fully a thousand miles inland; then, by transfer to other ships, they may be taken on canals, rivers, and lakes as far as Duluth. By this means, and by railways also, raw products from the North, East, South, and West collect at Montreal, either to be manufactured, or to be shipped farther. In its extensive connection with the interior of Canada, by water and by rail, Montreal reminds us of New York; but since it has a less productive territory to draw upon, it has grown far less rapidly than New York.

As in the large cities of the United States, there are many kinds of manufacturing in Montreal, including the making of sugar, boots and shoes, cotton and woolen clothing, India-rubber goods, furniture and other articles of wood, various steel and iron products, and cigars.

Farther down the river is QUEBEC, which was once the center of the French government in Canada, and the principal city. It is situated on a high bluff rising above the St. Lawrence, and is fortified so as to command that river. The better location of Montreal, farther inland, has drawn the commerce away from Quebec. The advantage of Montreal's situation has been greatly increased by the building of ship canals around the rapids; also by the dredging of the St. Lawrence, thus deepening the channel so as to admit ocean vessels as far as the city.

Quebec is one of the quaintest and most interesting cities on the continent. It resembles a bit of the Old World, transplanted to America, and a visitor from the

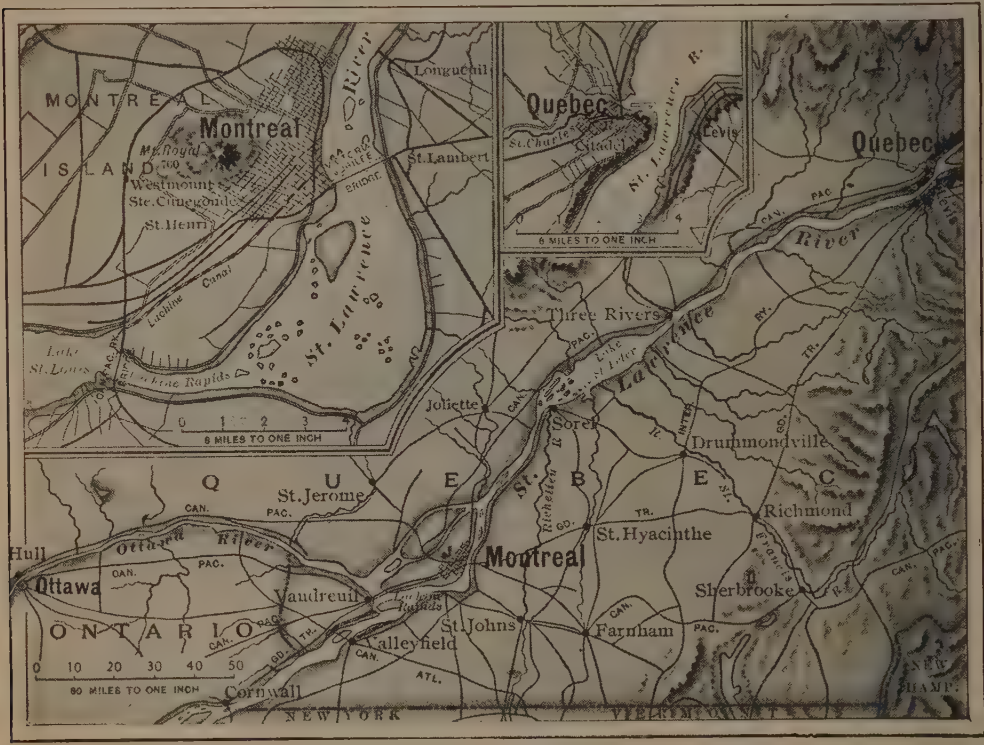


FIG. 228.—Map to show the location of Montreal, Ottawa, and Quebec.

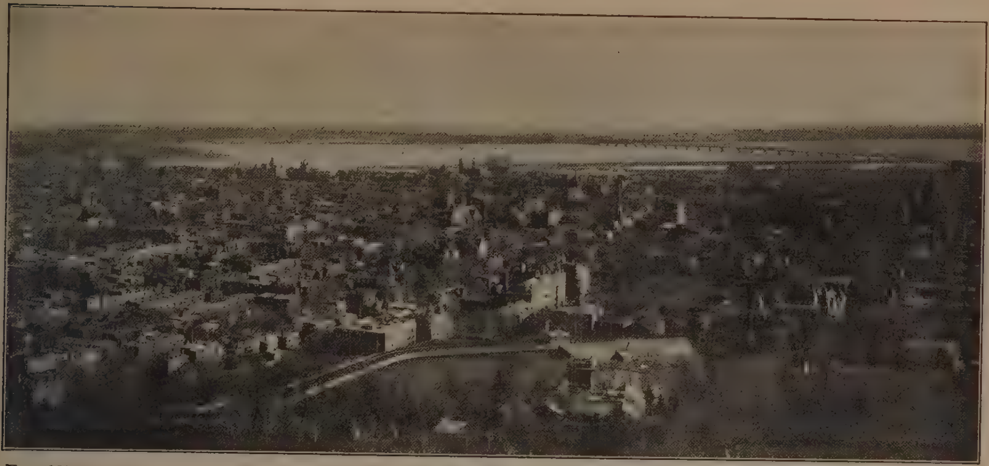


FIG. 229. — A view of Montreal from the hill called Mount Royal, which rises directly behind the city. In the distance is the broad St. Lawrence. Notice the long bridge crossing it.

United States feels that he is indeed in a foreign country. There is some manufacturing there, such as the making of boots and shoes.

OTTAWA, the capital of the Dominion, is above Montreal, at some large falls in the Ottawa River. On account of this fine water power, it has much manufacturing, and is especially noted for its lumber manufactories. It has beautiful government buildings, known there as the *Parliament Buildings* (Fig. 230).

2. Along the Atlantic coast

What Canadian cities on the Atlantic coast have already been mentioned, and in what connections? One of these, HALIFAX, in Nova Scotia, is one of the oldest cities in Canada. Although it has an excellent harbor, Halifax has never become a great city. The reason is easily seen on examining the map (Fig. 219). The narrow peninsula of Nova Scotia is not large enough to supply raw materials and man-

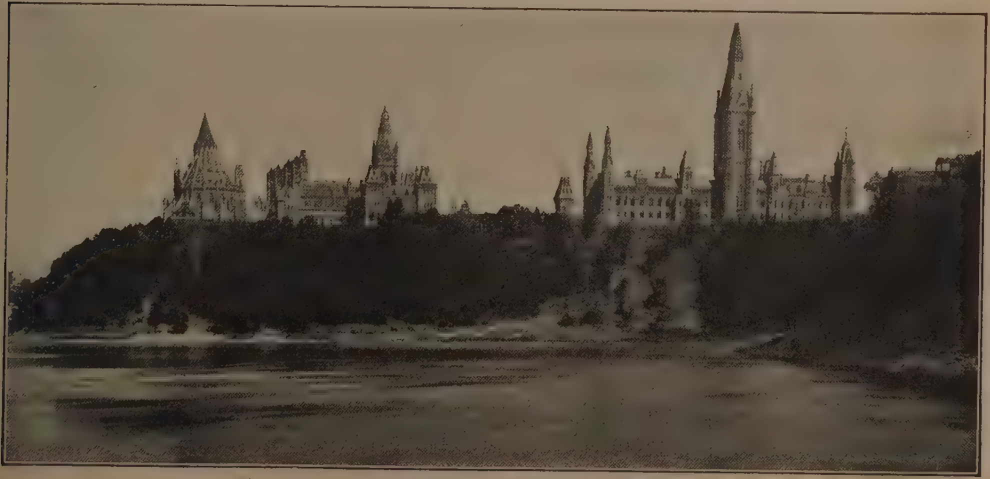


FIG. 230. — The Parliament Buildings at Ottawa.

ufactured articles in sufficient quantity to make it a great shipping point, and the country farther west is too difficult to reach. It is much cheaper to send Western goods to Montreal, for shipment eastward, than to carry them by rail as far as Halifax.

New York and Montreal show clearly the reasons why some cities flourish; and Halifax is an equally good illustration of the reason why other cities fail to grow so rapidly.

3. Along the Great Lakes

Toronto, the second city in size in Canada, is located on an excellent harbor on the shores of Lake Ontario. Being in the midst of a fertile farming country, and having water connection with coal on the east and south, and with lumber and other raw products on the west, Toronto has become a great manufacturing center. At the same time it is one of the most attractive cities on the continent.

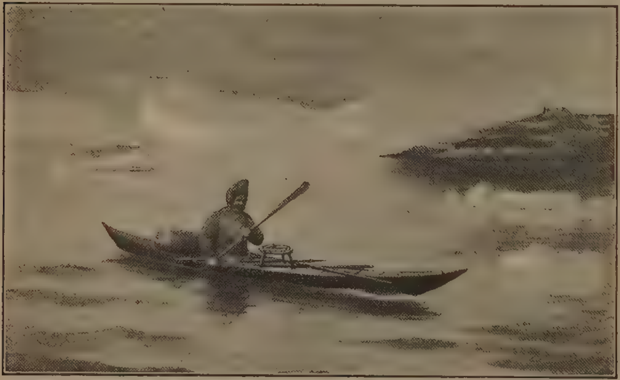


Fig. 231. — A Greenland Eskimo in his skin-boat, or kayak. In the distance are icebergs which have broken off from the great Greenland glacier.

Not far from Toronto, on the extreme western end of Lake Ontario, is Hamilton, a manufacturing and trade center; and there are other cities on the same peninsula, the largest being London. At the eastern end of Lake Ontario, near the Thousand Islands, is Kingston, which has cotton and woolen mills, car shops, and locomotive works, besides being a lake port and railway center. Windsor (Fig. 154), opposite Detroit, shares some of the advantages of that city, being a shipping point and a manufacturing center. Port Arthur, whose location corresponds to that of Duluth in the United States, is a shipping point for grain, cattle, and other Western products.

What have you already learned about Winnipeg?

4. Other cities

Vancouver, on the Pacific coast, has already been mentioned. In what connection? Across the strait on the island of Vancouver, is the city of Victoria. How do these two cities compare in size with the two largest on Puget Sound? (See Appendix, pp. 428 and 430.)

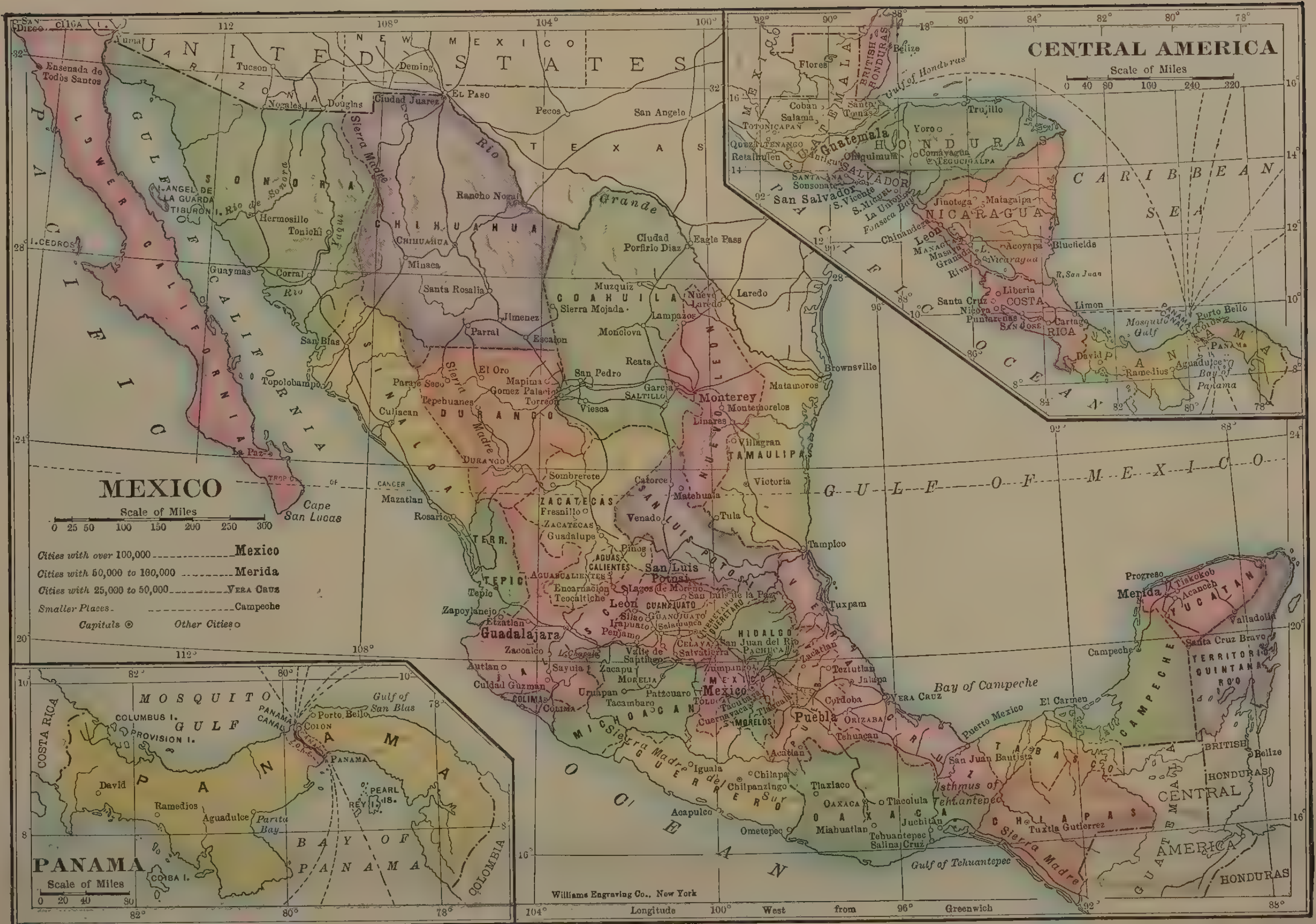
2. Greenland

The Eskimos (Fig. 231) living on the west coast of Greenland are under the control of the Danes, who trade with them for skins, walrus, ivory, blubber, and eider down. The most northern of the Danish trading stations is Upernivik, which is the most northern point in the world where white men live. Some uncivilized Eskimos, however, have homes still farther north.

Most of Greenland is a barren waste of ice and snow — one of the most complete deserts in the world. There is no living thing to be found in the ice-covered interior. The extent of this land, and other facts about it, you have already studied in connection with the Great Glacier (p. 7).

Review Questions

1. What two nations struggled for possession of Canada, and what was the result? 2. How many provinces are there in Canada, and what are their names? 3. What can you tell about Newfoundland? 4. Show how fully the surface features of southern Canada correspond to those of our Northern States. 5. What have been the effects of the Great Glacier here? 6. Describe the climate. 7. Where are the forests? 8. What is the method of lumbering, and what are the leading lumber centers? 9. Where are food fish caught? What kinds are caught? 10. What about the sealing? 11. What are the farm products in the West? 12. State the principal facts about ranching. 13. Where is the principal grain region, and what is the leading city there? 14. Where is the most populous farming section, and what are its products? 15. What about farming in southeastern Canada? 16. What can you tell about mining in British Columbia and Yukon Territory. 17. What mineral products are found in Ontario and southeastern Canada? 18. What are the conveniences for transportation? 19. Locate and tell the principal facts about the leading cities along the St. Lawrence and Ottawa rivers. 20. Along the Atlantic coast. 21. Along the Great Lakes. 22. Locate and tell about other cities of importance. 23. What is the condition in Greenland?

MEXICO
Scale of Miles
0 25 50 100 150 200 250 300
Cities with over 100,000 Mexico
Cities with 50,000 to 100,000 Merida
Cities with 25,000 to 50,000 Vera Cruz
Smaller Places Campeche
Capitals ⊛ Other Cities ○
CENTRAL AMERICA
Scale of Miles
0 40 80 160 240 320
PANAMA
Scale of Miles
0 20 40 80
UNITED STATES
NEW MEXICO
ARIZONA
TEXAS
GULF OF MEXICO
PACIFIC OCEAN
GULF OF CALIFORNIA
LOWER CALIFORNIA
SONORA
CHIHUAHUA
COAHUILA
NUEVO LEON
TAMAULIPAS
SINALOA
DURANGO
ZACATECAS
SAN LUIS POTOSI
TEPIC TERR.
AGUAS CALIENTES
GUANAJUATO
QUERETARO
HIDALGO
MEXICO
MORELOS
JALISCO
COLIMA
MICHOACAN
GUERRERO
PUEBLA
VERA CRUZ
OAXACA
TABASCO
CHIAPAS
CAMPECHE
YUCATAN
TERRITORIO QUINTANA ROO
BRITISH HONDURAS
GUATEMALA
HONDURAS
SALVADOR
NICARAGUA
COSTA RICA
PANAMA
COLOMBIA
CARIBBEAN SEA
Bay of Campeche
Gulf of Tehuantepec
Isthmus of Tehuantepec
Sierra Madre
Rio Grande
Mexico
Guadalajara
Puebla
San Luis Potosi
Monterey
Leon
Merida
Vera Cruz
Tampico
El Paso
Ciudad Juarez
Chihuahua
Durango
Zacatecas
Acapulco
Oaxaca
Campeche
Belize
Guatemala
San Salvador
Tegucigalpa
Managua
San Jose
Panama
Colon
Porto Bello
Panama Canal
Bay of Panama
Gulf of San Blas
Mosquito Gulf
Pearl Is.
Tropic of Cancer
Longitude West from Greenwich
32° 28° 24° 20° 16°
112° 108° 104° 100° 96° 92° 88°
Williams Engraving Co., New York

Suggestions

1. Compare the area of Canada with that of the United States (Appendix, pp. 424 and 426). 2. Compare the populations (Appendix). 3. Read the story of "Evangeline." 4. Lake Erie is how much higher than Lake Ontario? How are ships able to pass from one lake to the other? 5. Why should Buffalo grow more rapidly than Toronto? 6. Of what advantage is it to the United Kingdom to have such a large, productive colony as Canada? 7. What books on Arctic travel have you read? Tell some of the things you have learned from them. 8. Read Nansen's "First Crossing of Greenland" or Peary's "Northward over the Great Ice." 9. Recall facts that you have already learned about the Eskimo.

VI. COUNTRIES SOUTH OF THE UNITED STATES

Map Study

Mexico. 1. Describe the relief of Mexico. 2. Name the two large peninsulas. 3. What river forms a part of the northern boundary? 4. What salt waters border Mexico? 5. Find the capital. 6. Find the seaport Vera Cruz. 7. Compare the coast line with that of the northeastern part of the United States.

Central America. 8. Name the countries. 9. What sea lies to the east? 10. What large lake do you find? 11. Examine the small map of the Panama Canal. Describe the route proposed. 12. Name the two cities at the two ends of the canal.

West Indies (Fig. 205). 13. Find the Bahamas; the Lesser Antilles; the Greater Antilles. 14. Name the four largest islands in the West Indies. 15. In what zone do the West Indies lie? 16. What waters touch the shores of the West Indies? 17. What nation owns the Bahamas? 18. What other nations have possessions in the West Indies? 19. Locate the Bermuda Islands on the map, Figure 9.

1. Mexico

History

1. The inhabitants

After Columbus discovered the West Indies, the neighboring coast of the mainland was visited and settled. Thus the Spaniards came into possession of Mexico and some of the country to the north which now belongs to the United States.

The explorers found so much gold and silver in Mexico that many Spaniards settled there. They opened mines, and started coffee plantations, farms, and cattle ranches. Many of the Spaniards intermarried with the Indians, so that Mexico has a varied population. There are savage Indians, half-civilized Aztecs, Spanish and Indian half-breeds, and some pure-blooded Spaniards.

2. The government

Spain governed Mexico so badly that the people finally rebelled, and in 1821 won their independence. They then established a republic with a government modeled after our own. There are twenty-seven states, each with a government and capital, somewhat like our states; and there are three territories. There is also a central government, with the capital at MEXICO CITY, where the president lives.

3. Loss of territory

For a long time Texas, New Mexico, and Colorado, together with the country west of them to the Pacific, were a part of Mexico. Texas won its independence by war, and joined our Union (p. 88); and as a result of our war with Mexico, called the Mexican War, the United States obtained all the territory which in Figure 283 is marked "Mexican Territory ceded 1848."

Surface features

1. The four sections at different altitudes

Mexico consists of four sections, at different heights above sea level. The lowest of these is a coastal plain, and other lowlands, near the sea. The second includes the slopes that extend toward the highlands of the interior. The third is the highland itself, a broad table-land, or plateau, occupying a large part of the interior of the country (Fig. 10). The fourth consists of mountain ranges and peaks, which are a continuation of the Cordillera of our Western States. Among the mountains, as in the United States, are volcanic cones (Fig. 233), two of them, Orizaba and Popocatepetl (Fig. 240), being among the highest peaks on the continent.

2. Its rivers

The divide of this narrow part of North America extends from north to south, sending some of the streams eastward, others westward. Thus all the streams of the country are short. They have a rapid fall in descending from the interior plateau, and have cut deep canyons in its edges. In addition, the streams pass through such an arid country that they have little water. Rivers of this kind are not useful for navigation. This lack of large, navigable rivers has greatly interfered with the development of Mexico. Suggest why.

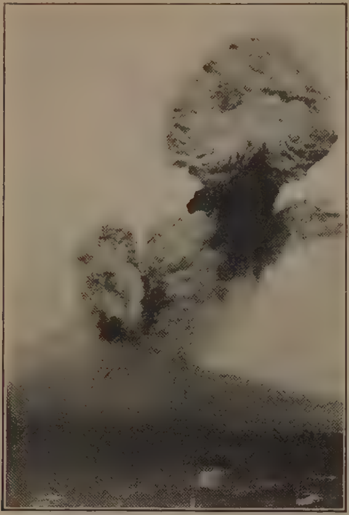


FIG. 233. — Colima, a Mexican volcano, in eruption. This great column of steam and volcanic ash has been expelled with terrific force, rising to a height of over a mile.

3. The coast line and harbors

As in our Southern States, the land has been rising instead of sinking. Therefore the coast is regular, and there are few good harbors. There are two large peninsulas projecting from the mainland. One of these is Yucatan; the other is Lower California, a southern extension of the mountains of our Western States.

Climate

Mexico has four different kinds of climate, corresponding somewhat closely to the four areas of different altitudes. The low coastal plains, near Vera Cruz and in Yucatan, have th hot climate of the tropical zone (Fig. 234 with abundant rain brought by the dam winds that blow across the Gulf of Mexic and the Caribbean Sea.

On the slopes west of these plains th temperature is not so hot, but there is muc rain. This belt has a subtropical climate.

The interior plateau is so high that th climate is temperate, even in the part tha lies south of the Tropic of Cancer; bu there is so little rain that the country i arid (Fig. 299). The climate become steadily cooler the higher one goes. Indeed, even within the tropical zone, ther are places among the mountains where th snow never melts, and where there are tru glaciers. On these high mountain slope the rainfall is quite heavy.

Products from forest trees and other native plants

In the greater part of Mexico forests ar rare, except upon the higher mountains. I fact, there is so little forest on the arid plateau that the inhabitants find difficulty in obtaining wood for fuel. Much of this is dug from the ground; for som of the arid-land bushes, such as the mesquite, have long, thick roots which mak excellent firewood. The other plants foun in the arid lands resemble those of ou Western States (p. 16).

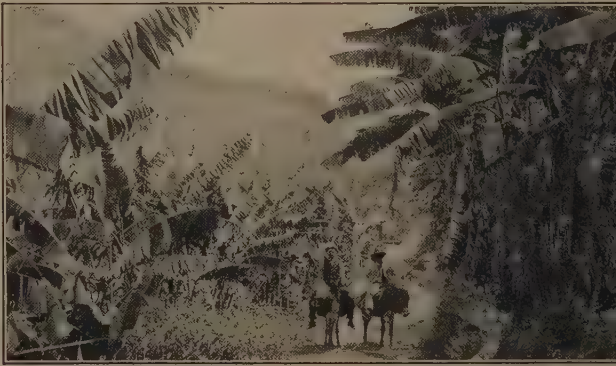


FIG. 234. — A view in the tropical lowlands of Mexico near the coast, calle the "hot lands." The road is bordered by banana trees.

In southern Mexico and on the damp lowlands, on the other hand, there are dense tropical forests. In these are found many valuable woods, such as mahogany, rosewood, and logwood. The rubber tree also grows here, and large quantities of rubber are obtained.

One of the most valuable of the native plants is the heniquen, a variety of hemp, which thrives in Yucatan. Among the exports of Mexico, this and other fibers rank next in value to mineral products, most of the fiber going to the United States.

Another product is the vanilla bean, which grows upon a climbing plant. In the seed-pod are nestled the fragrant beans which are used for making flavoring extracts, for perfumeries, and for medicine. Pepper, made from the dried berry of a tropical plant, is obtained in Mexico. Indigo, useful as a dye, is likewise obtained from a berry in this region; and sarsaparilla is extracted from the roots of a tropical plant that grows here.

Agriculture
1. On the arid plains
(1) *Products by irrigation*

Although the climate of a large part of Mexico is arid, agriculture is the principal industry of the people. This is partly due to the snows and rains among the mountains, which supply water for irrigation. On the irrigated farms the products of the temperate zone are raised, such as wheat, corn, and beans — the latter being one of the staple foods of the Mexicans. Much fruit is also produced, especially apples, pears, peaches, and grapes.

A species of native arid-land plant, called *agave*, is of great value. The stout, sharp-pointed leaves of the agave rise in a tuft from near the ground; in the center stands the flower stalk, which sometimes reaches a height of forty feet, and which bears a cluster of white flowers on the top. This is also called the century plant, because it requires so long (from ten to seventy years) to mature and produce this flower stalk. From the juice of the agave the Mexicans obtain an alcoholic drink known as pulque, and another known as mescal. The tough leaves of some varieties of agave contain a fiber which is made into paper and a strong thread; and from the juices of one kind, called the *maguey*, soap may be made. So valuable is the maguey that it is carefully cultivated upon plantations (Fig. 235).

(2) *Farming methods; and home life*

The Mexican farming methods, which are very crude, are a mixture of ancient Aztec customs and those introduced from Spain several centuries ago. One may still see the wooden plow which barely scrapes the ground; and also the wooden-wheeled cart drawn by oxen. There are, however, many farmers who have adopted the same methods of farming as we have; and every year their number is increasing, for Mexico is now advancing rapidly.

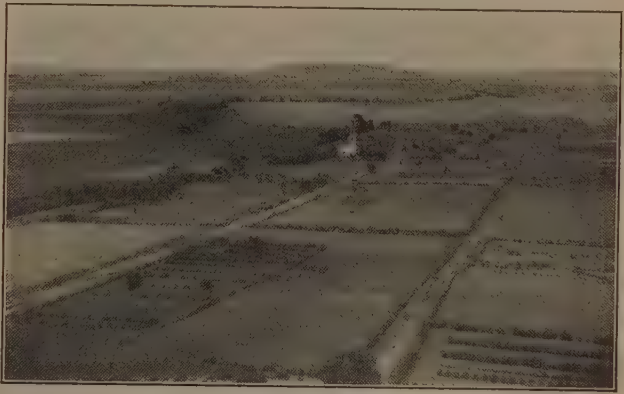


Fig. 235. — Irrigated fields on the plateau of Mexico. The rows of plants on the right are maguey.

The home life of the people is interesting. Their houses have but one story, and are commonly built of sun-dried bricks, or *adobes* (Fig. 192), held together by layers of mud. Often there is but one room (Fig. 236), the ceiling being made of brush, and the floor of nothing but earth or stones. In this one room the whole family cook, eat, and sleep. Their food consists of very simple materials, such as unraised bread, baked in the fireplace, beans, and sometimes meat, commonly cooked with red pepper. Men, women, and even children use tobacco.

While this description is true for the poorer classes, it of course does not apply to the wealthier and educated Mexicans. But even these have adobe houses, which somewhat resemble those of southern Spain.

So much of Mexico is arid that large sections are suited only to grazing. For

FIG. 236. — Interior of a Mexican adobe house.

(3) *Ranching*

this reason, one of the leading industries is ranching. As in our Western States, there are extensive cattle and sheep ranches; and hides, meat, and wool are important exports.

Many horses and mules are raised; but the little Mexican jackass, or *burro*, is one of the most common draft animals (Fig. 237). It is the size of a small pony, and is made to do all kinds of work. The burro is a very patient beast, and is able to carry heavy loads and endure much hardship.

Hogs are fattened in large numbers, and there are many goats. The latter are much prized, not only for their meat and hides, but also for their milk, which is used as a food and in making cheese.

2. On the lower, humid lands

On the damp lowlands, the farm products are quite different from those on the arid plateau. There rice, sugar cane, and cotton are produced; also tropical fruits, such as oranges, bananas, cocoanuts, and pineapples. Upon the slopes between the tropical lowlands and the temperate plateau much cotton, tobacco, and coffee are raised.

Coffee, one of the most valuable products of Mexico, requires a rich soil, abundant moisture, a warm climate, and plenty of shade. In order to secure shade, the coffee bush, which reaches a height of from ten to fifteen feet, is planted in the shade of higher trees. A white blossom appears as early as
March, and after the flower falls o
the coffee berry begins to grow (Fi
238). It resembles a dark red cra
berry. The coffee is inside of th
berry in the form of two kernel
and the husk must be removed i
order to prepare such kernels f
market.

Mining

1. Extent of minerals

One of the principal object
of the Spaniards in explorin
the New World
was to obtain gold
and silver; and
they were rewarded in thei
search by the discovery of ric
mines both in Mexico an
South America. Some
these mines had been worke
by the Indians; others we
found by the Spaniards them
selves. Mexico is still a great minin
country, rivalling the United States in th
production of silver.

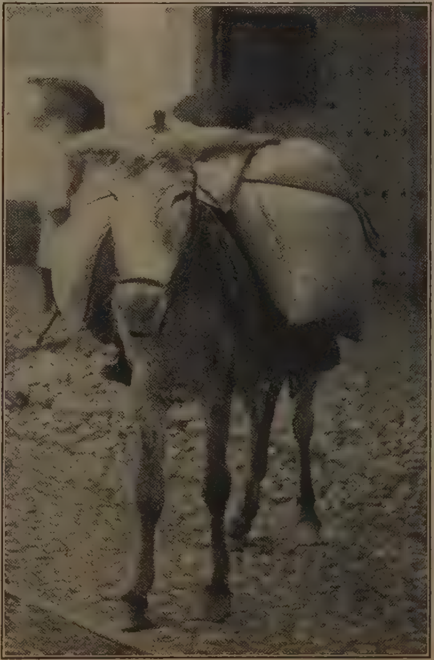


FIG. 237. — A Mexican burro carrying heavy sacks.

Much gold, copper, lead, and zinc are also produced, and recently great quantities of petroleum have been found on the coastal plain, as in Texas and Louisiana. A large amount of iron is known to exist in several parts of the country. At one place, near DURANGO, there is an iron mountain which contains an enormous amount of very rich ore. Here blast furnaces have been erected, and steel rails and other iron goods are manufactured. Find this city on the map.

2. Difficulties in the development of mining

One great obstacle to mining in Mexico is the lack of good coal. Another is the lack of easy transportation. A third is the fact that much of the region cannot easily be explored for ore. In fact, some parts of the country are still occupied by tribes of savage Indians, who not only prevent miners from coming in, but even defy the government. Still another difficulty is the old-fashioned methods of mining employed by many of the Mexicans. Some of these are the same as those used by the Indians centuries ago. But the methods are being improved, for many of the leading mines are now owned by Europeans, Americans, or educated Mexicans. Mining is now rapidly developing in Mexico, and minerals form more than half of the exports. Fibers are the second export in importance, and coffee the third.

Manufacturing

Because of the ignorance of the working people, and the scarcity of coal, there is not a great deal of manufacturing in Mexico; and that which is done is largely carried on by hand. Some of this hand work is very beautiful, for even the uneducated Mexicans are quite artistic.

There are large tobacco factories in the tobacco district, and smelters in the mining regions. Some earthenware is also manufactured, and some cotton cloth. Indeed, cotton manufacturing is growing rapidly in importance, the cotton used being that which is grown in Mexico. More money is now invested in cotton mills than in any other form of manufacturing.

There are no large manufacturing towns such as we find in many parts of the United States; but Mexico is making rapid progress. There is much water power where the streams descend from the plateau, and this is being used for producing electricity. Railroads, too, are being built in many parts of the republic. But, most important of all, those now in control are encouraging all kinds of industry and providing better facilities for education.

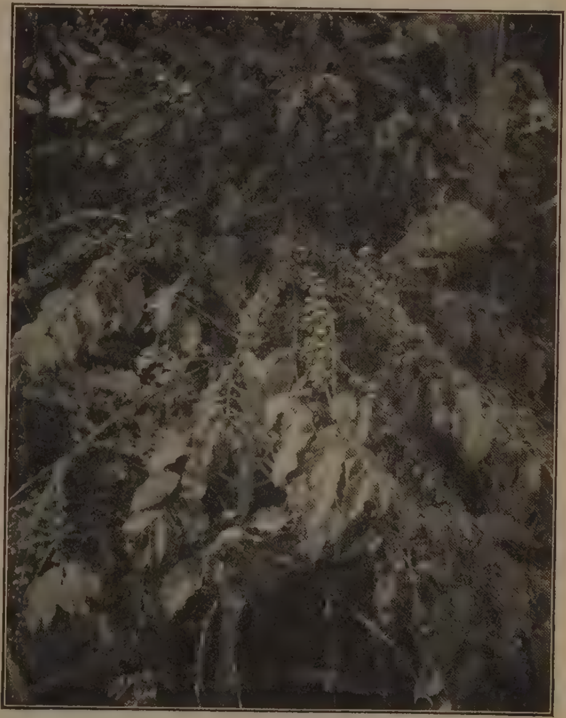


FIG. 238. — Coffee tree and berries growing in the shade of higher trees.

Leading cities
1. In the interior

Wherever possible, the Mexicans have collected in cities or towns (Fig. 239). This has been necessary in many sections in order to obtain the water supply needed for irrigation. It is usually too great a task for a single farmer to build a ditch; and there-

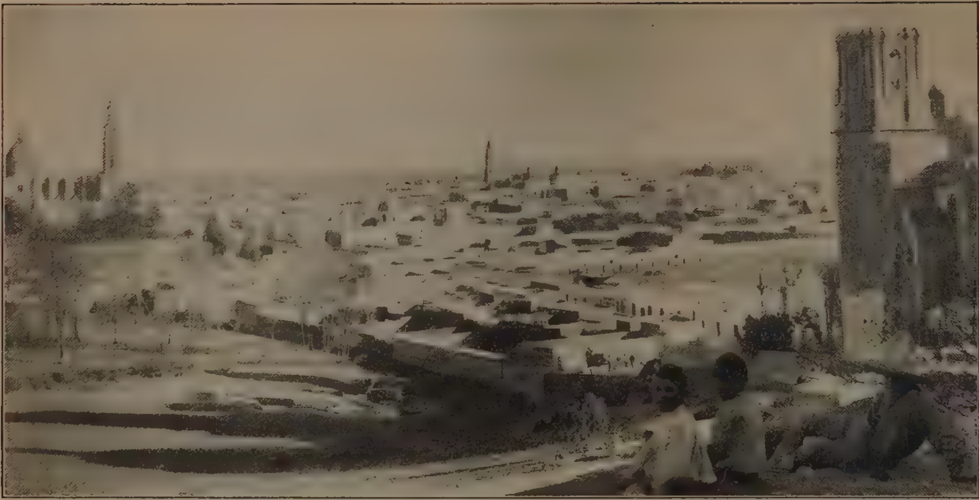


FIG. 239. — A view of Leon, one of the cities on the plateau of Mexico. Notice how low the houses are. Most of them are one-story adobe buildings.

fore a number combine and thus live close together.

There are a few large cities, the greatest being the capital, MEXICO CITY (Fig. 240), built on the site of an ancient Aztec Indian city. It is situated on a high plateau and therefore, although so far south, has a cool climate. In this city, as elsewhere in Mex-

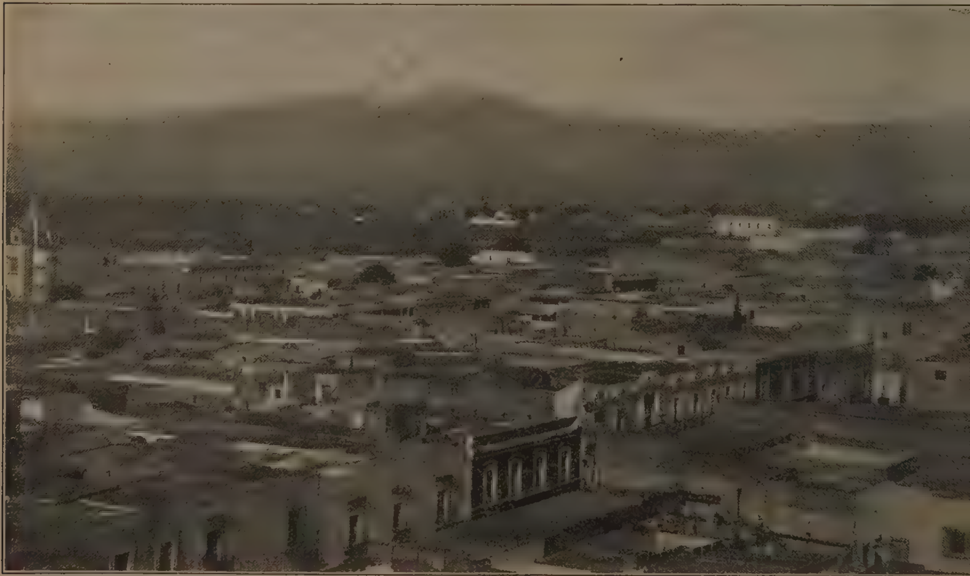


FIG. 240. — A view of a part of Mexico City, with the snow-capped cone of the volcano Popocatepetl rising in the distance

ico, there are many fine churches and other notable buildings. Another city in the interior of Mexico is Puebla, founded in 1531. It also is situated near one of the ancient cities, or pueblos, of the Aztecs. Guadalajara is a third important Mexican city. Locate each of these cities.

2. On the coast

Since the eastern coast of Mexico is low and sandy, it has no good harbors. The two largest cities there are Tampico and Vera Cruz, whose harbors are protected by breakwaters. There are some good harbors on the western coast. One of these is Acapulco, but since it is backed by high mountains and a thinly settled country, that port has never become of much importance.

2. Central America

Names of the countries and their government

Of the six Central American republics, the smallest is Salvador; the next, Costa Rica. Nicaragua, Honduras, and Guatemala are about equal in size. These are all in North America; but the Republic of Panama is partly in North America and partly in South America. It has a special interest for us. Why (p. 154)?

These six countries are independent of each other, and each has a form of government modeled after that of the United States. In addition to these countries, on the eastern side of the Yucatan Peninsula is British Honduras (or Belize), a colony of the United Kingdom.

Character of the people

The inhabitants of the Central American republics are mainly Indians, Spaniards, and half-breeds. The great majority are uneducated, and many are even uncivilized. Largely on account of the ignorance of the people these countries are not good examples of republics. An ambitious general, finding a few followers, may at any time try to overturn the government. There has been rebellion after rebellion in these nations; presidents have been driven away or murdered; and the countries have quarreled with one another.

Character of the region

Most of Central America is mountainous, and is subject to volcanic eruptions and to earthquakes of great violence. The earthquake shocks have leveled towns and killed thousands of people. For instance, San Salvador, the capital of Salvador, was so frequently destroyed by earthquakes that the inhabitants decided to choose a new location for their city; but this is scarcely better than the old one.

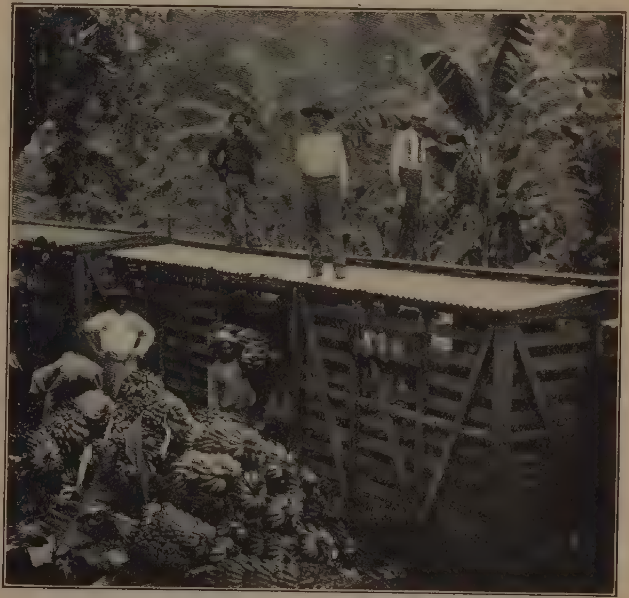


Fig. 241.—Loading bananas on a banana plantation in Costa Rica. The bananas are then taken to the coast and placed on steamers to be shipped to the United States.

Since these countries lie in the tropical zone, the climate is hot. The rainfall is heavy, especially on the eastern coast, where there are dense jungles.

The products

A large portion of these countries is occupied by dense tropical forests, from which are obtained mahogany, rosewood, logwood, fustic, and other valuable cabinet and dye woods. The rubber tree also grows here, and the production of rubber is an important industry.

As in Mexico, coffee is raised on the hill slopes in the shade of the forest trees. Costa Rica is one of the most important coffee-producing districts (Fig. 242). Bananas (Fig. 241), sugar, tobacco, indigo, and cocoa are other products.

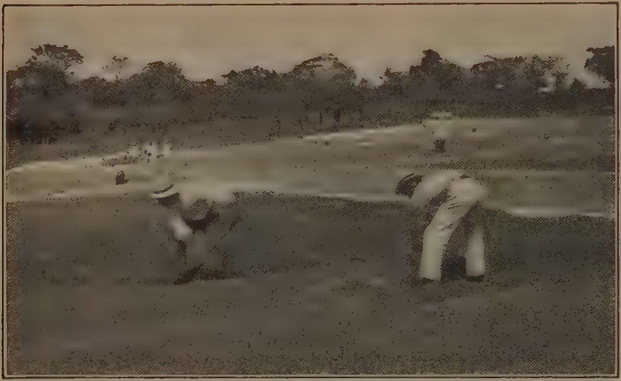


FIG. 242.—Drying coffee berries in Costa Rica. There are tons of coffee berries here spread out in the sun to dry. After they are dried, the husk is removed and the bean is then shipped away.

Some gold and silver are obtained, the former near Bluefields, the latter in Honduras. Manufacturing is little developed.

The leading city

The largest city in Central America is NEW GUATEMALA, the capital of Guatemala. This city, which was formerly situated at the base of two very active volcanoes, was changed to a safer site; hence the name *New Guatemala*.

3. The West Indies (see the Map, Fig. 205)

Location and names of the groups of islands

A chain of islands reaches from the Yucatan and Florida peninsulas to the mouth of the Orinoco River on the South American coast. These islands inclose the Caribbean Sea; and, also, with the aid of the peninsulas of Florida and Yucatan, the Gulf of Mexico. All of this archipelago, excepting the Bahamas, lies entirely within the tropical zone.

These islands, scores of which are very small, are called the West Indies, because Columbus thought he had reached India. With the exception of the Bahamas, the are also known as the Antilles. Those o the north, including the larger ones, ar called the Greater Antilles; and those o the south, the Lesser Antilles

The Greater Antilles

Two of the Greater Antilles have already been described (p. 152). What do you remember about them?

1. Jamaica

(1) Governmen and people

South of Cuba lies the islan of Jamaica, the third in size i the West Indies, and a possession of Great Britain. The inhabitants are mainl either negroes or mulattoe there being fully forty black to one white person.

(2) Products

This island is mountainou in the center, but has excellen soil on the lower slopes and in the valleys, and is very productive. The chief occupatio is agriculture, and the women are employe in outdoor work as much as the men. On of the main products is sugar cane. Earl vegetables and fruits, such as orange and bananas (Fig. 243), are also raised Jamaica ginger, of which every one ha heard, is obtained from the root of a plan that grows in this island.

The climate and scenery are very attractive, an many people from the United States go there for part of the winter. Regular ocean steamers carr passengers, together with great quantities of tropica fruits and vegetables.

(3) Earthquake

As in other islands of the West Indies, earthquakes are common. One of these, in 1906, caused great destruction in KINGSTON, the capital and leading city.

2. Haiti

(1) Governmen

Haiti was the first large island discovered by Columbus, and on it he made settlements and opened mines. Like the other Greater Antilles, this became an important Spanish colony; bu Spain lost one island after another, the las to go being Cuba and Porto Rico (p. 152).

Haiti has long been independent, and there are now two republics in the island — Haiti and Santo Domingo. The capital of the former is PORT AU PRINCE; and of the latter, SANTO DOMINGO. They are not very progressive republics, and, as in Central America, revolutions are very common. Most of the inhabitants are negroes and half-breeds, descendants of the slaves of the Spanish settlers; but there are more white people in Santo Domingo, which is more progressive than Haiti.

(2) *Products*

Many of the natives obtain their living in the most primitive fashion, like the negroes of Africa; but others, especially near the seacoast, are engaged in raising sugar, tobacco, coffee, and bananas. There are valuable woods covering much of the island, and some mineral wealth; but little is done with these resources.

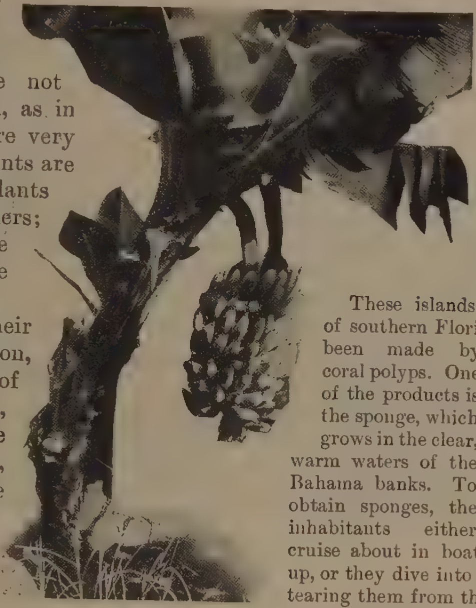


FIG. 243. — Bananas as they grow, hanging in great bunches from the broad-leafed banana tree.

The Lesser Antilles

(1) *Government and products*

Most of the islands among the Lesser Antilles are possessions of Great Britain, though some belong to other nations. For instance, Martinique and Guadeloupe belong to France; St. Thomas and St. Croix to Denmark; and some to Holland. The products of the Lesser Antilles are similar to those of the other West Indies, the most important being sugar cane.

(2) *Volcanoes and earthquakes*

These small islands are volcanic cones. Most of the volcanoes are now extinct, but in Martinique and in St. Vincent there have been violent volcanic outbursts. One of the most terrible volcanic eruptions ever recorded occurred in Martinique in 1902. After being quiet for about fifty years, Mont Pelée (Fig. 244) suddenly burst forth and completely destroyed the beautiful city of St. Pierre, which was situated at its base (Fig. 245). In a few seconds all of the inhabitants, over twenty-five thousand people, were killed by the cloud of steam and hot ash which descended upon them.

The Bahamas

1. Government and chief city

North of Haiti and Cuba are several hundred small islands called the Bahamas, which belong to Great Britain. A number of these are inhabited, and on one is situated the city of NASSAU.

2. How the islands were made; also occupations and products

These islands, like the coast of southern Florida (p. 72), have been made by coral polyps. One of the products is the sponge, which grows in the clear, warm waters of the Bahama banks. To obtain sponges, the inhabitants either cruise about in boats, raking them up, or they dive into the clear water, tearing them from the bottom.

On the land, early vegetables, pineapples, oranges, and cocoanuts are raised by the inhabitants, who are chiefly negroes. One of the industries, as on the neighboring coast of Florida, is

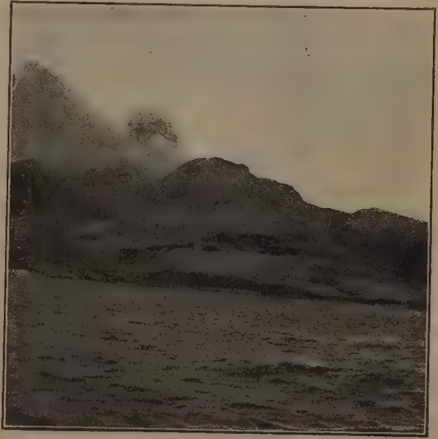


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FIG. 244. — A view of Mont Pelée. When this picture was taken a small eruption was just beginning, and the steam and ash are seen rising from the crater.

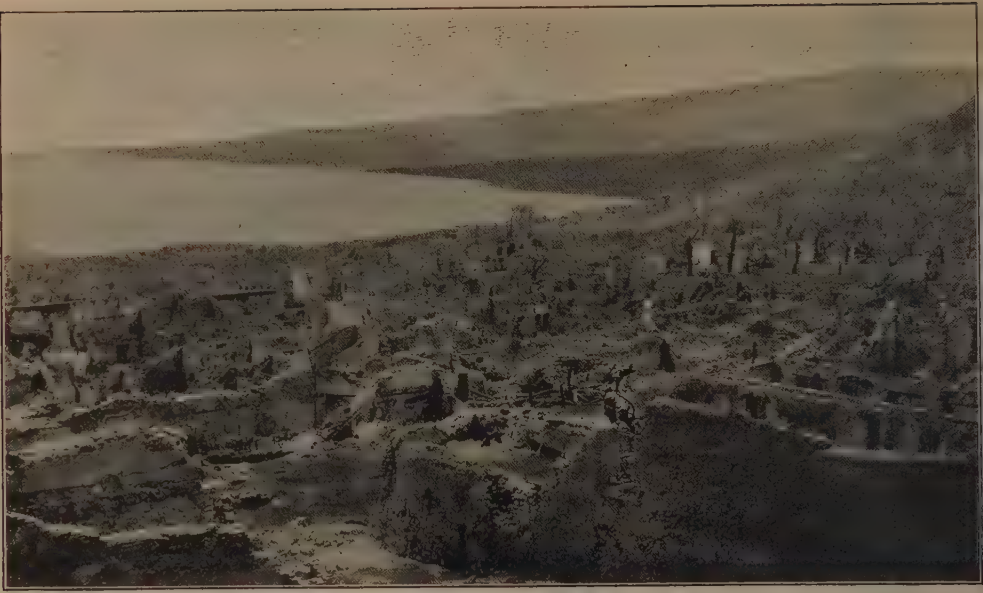


FIG. 245. — The ruined city of St. Pierre after the terrible volcanic eruption of 1902.

caring for winter visitors. Why should people wish to go there?

4. The Bermudas (Fig. 9)

Location and climate

Far out in the Atlantic, six hundred miles east of the Carolinas, and alone in mid-ocean, is a cluster of islands, known as the Bermudas. The largest is only fifteen miles long and one or two miles wide. Being in the open ocean, and surrounded by warm ocean currents, these islands have a delightful and equable climate. In midwinter, when people in the same latitude in the United States are shivering with cold, those in the Bermudas are able to sit out of doors in comfort, both day and night.

People and occupations

This group of islands, which belongs to Great Britain, is inhabited mainly by negroes and mulattoes, who are engaged in raising early vegetables for the American market, especially potatoes and onions. Another important product is the Easter lily, great fields of which are cultivated for the Easter season. Many persons from the United States are attracted here every winter, most of whom stay in the largest city, HAMILTON.

Review Questions and Suggestions

MEXICO: QUESTIONS. 1. Give some facts about the history of Mexico. 2. Explain about the four sections in Mexico that have different altitudes. 3. Tell about its rivers. 4. Its coast line and harbors. 5. Its climate. 6. What are the products from the forest trees, and other native plants? 7. What agricultural products are obtained by irrigation? 8. Describe the farming methods and the home life in the arid lands. 9. Where is ranching carried on? What animals are raised? 10. What products are obtained from the lower humid lands? 11. What about the extent of minerals in Mexico? 12. Mention several difficulties in the development of mining there. 13. What is the condition of manufacturing? 14. Name and locate the leading cities in the interior. 15. On the coast.

SUGGESTIONS. 16. Find out why coffee raising requires special care. 17. Find an article of furniture made of mahogany. 18. Walk toward Mexico City. 19. What reasons can you give for its location? 20. Who is the president of Mexico? 21. Make a sketch map of Mexico.

CENTRAL AMERICA: QUESTIONS. 22. Name the countries here, and tell their form of government. 23. What is the character of the people. 24. Describe the region. 25. What are the products? 26. Name and locate the leading city.

SUGGESTIONS. 27. What disadvantages do you see in the lack of a central government for all the Central American republics? 28. In what other ways, besides saving coal, will the canal across Panama prove of advantage? Let a committee be appointed from your class to obtain definite facts about the matter. 29. Why will harbors at each end of the canal be necessary? 30. Make a sketch map of Central America.

THE WEST INDIES AND THE BERMUDAS: QUESTIONS. 31. Locate the West Indies, and give the names of their principal groups. 32. Tell what you can about the government, people, and products of Jamaica. 33. The earthquakes there. 34. What can you tell about Haiti? 35. State important facts about the Lesser Antilles. 36. About the Bahamas. 37. How are the Bermudas important? Locate them.

SUGGESTIONS. 38. How does each of the largest four of the West Indies compare in area and population with New York State? (See tables in Appendix, pp. 424 and 426.) 39. Find out more about the eruption of Mont Pelée.

VII. REVIEW OF NORTH AMERICA

The story of our continent

The natural advantages that North America possesses as a home for man have been the result of slow changes extending through millions of years.

How has our coal been formed (p. 2)? How about other minerals (p. 4)?

What great mountain systems have been produced (p. 4)? What about their height? What are the names of the principal ranges in the Cordillera? What do you know about the formation of the Mississippi Valley (p. 5)?

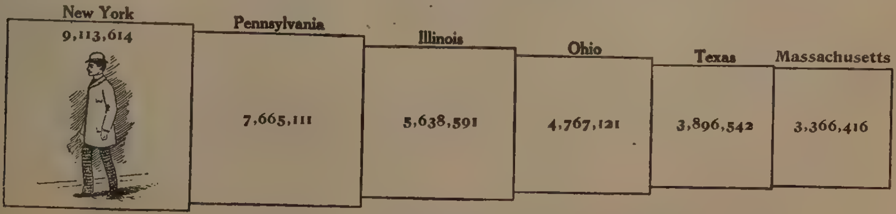


FIG. 247. — The six states with largest population (1910).

What portion of the continent was covered by the Great Glacier (p. 7)? Mention some of its important effects (pp. 9–11).

In what ways has the sinking or rising of the coast been important (p. 11)? State the present size and shape of the continent (p. 12). Show the importance of its position (p. 12).

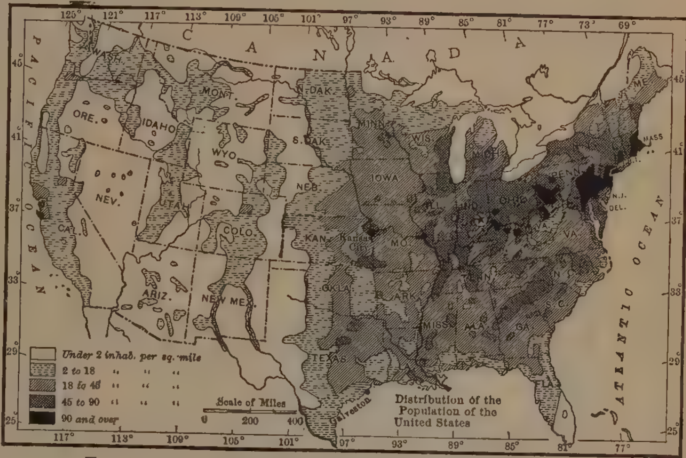


FIG. 246. — Distribution of population in the United States, 1910.

Its plants, animals, and peoples

Describe the plants and animals of the Far North (p. 14). Of our arid West (p. 16). What about the plants and animals in other parts of the temperate zone (p. 17)? About those of the torrid zone (p. 19)?

Describe the manner of life of the Indians (p. 22). Why did they never become more powerful (p. 23)?

What European nations tried to obtain possession of large portions of this continent

(p. 24)? Give some reasons why the English succeeded most fully (p. 26).

I. The United States

Population

1. Distribution of people in North America

At present there are probably as many as a hundred and twenty-five million persons living in North America, distributed among the four chief sections as follows: Central America, over five million; Canada, over seven million; Mexico, over fifteen million; and the United States (not including dependencies), more than ninety-one million (Fig. 246). From these figures it is clear that about three fourths of all the inhabitants of the continent are living in the United States.

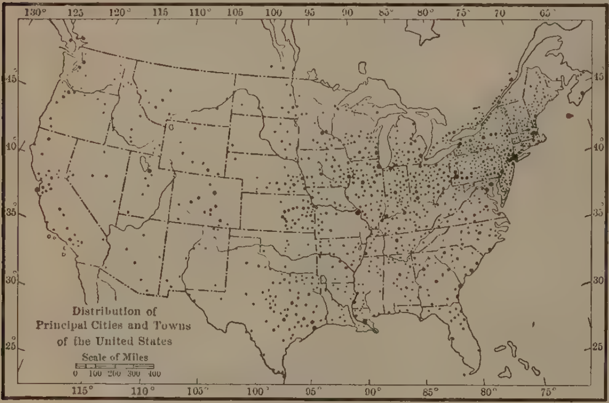

Distribution of Principal Cities and Towns of the United States
Scale of Miles
0 100 200 300 400

FIG. 248. — Map showing distribution of cities.

2. Distribution of people in United States

Figure 246 shows more clearly than Figure 248 the density of population in the different parts of the Union. Where are the most thickly settled portions? The most sparsely settled? How can you explain such distribution (p. 28)? Name in their order the six states having the greatest population (Fig. 247). Find the center of population (star in Fig. 246).

3. Number in cities, and in the country

Figure 248 gives the location of the cities, the largest having the largest dots. In the Appendix (p. 426) is a table of the twenty-five largest cities. Find the dots (Fig. 248) that represent several of these. In what respect are the two figures (246 and 248) alike?

The great cities are so numerous, and have been so often mentioned, that there is danger of valuing them too highly, as compared with the country. At the time of George Washington very few people lived in cities. Even at present about two thirds of our ninety-one million inhabitants live either in the country, or in towns with a population of less than eight thousand. In Mexico and Canada the proportion living in the country is still greater. In other words, the great

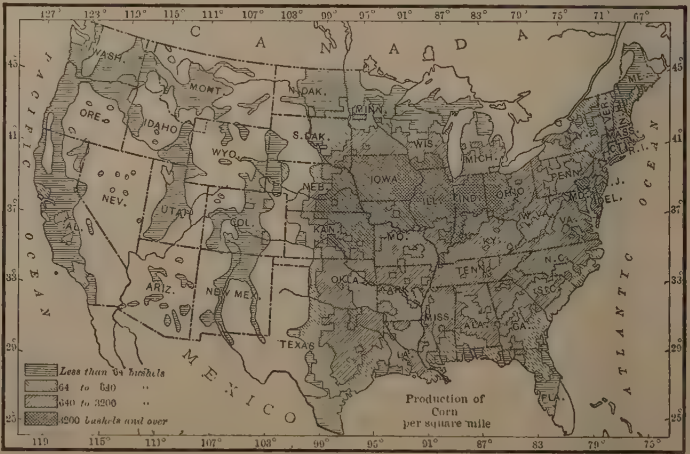


FIG. 249. — Map showing the regions of corn production in the United States.

majority of persons in North America are country people.

There are over five million families occupying farms in the United States. About how many persons does that represent? Why should so many people live on farms? The leading occupations of persons living outside of the cities are agriculture, lumbering, fishing, and mining. The most important of all is agriculture.

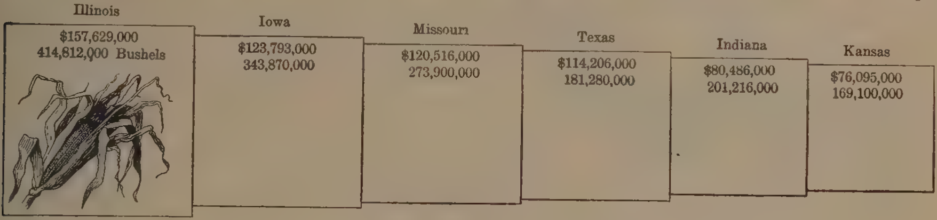


FIG. 250. — The six leading corn-producing states (1910).

Agriculture

1. Grains

Figure 249 shows the regions that are most extensively engaged in raising corn. What states are included? In 1910 over two and a half billion bushels were produced; how many bushels is that for each of our inhabitants? How is corn cultivated, and what are its uses (p. 95)? Which are the six leading states in corn production, and how do they rank (Fig. 250)?

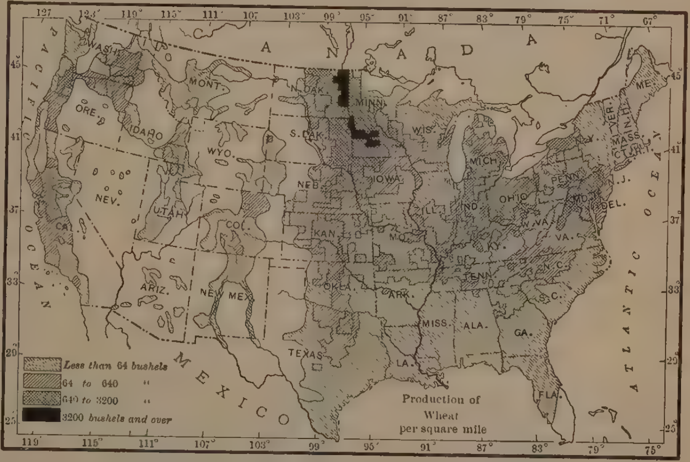


FIG. 251. — The wheat regions of the United States.

Many of the states that raise corn are also extensively engaged in the wheat industry. Figure 251 shows the principal wheat regions. Where are they? What can you tell about wheat in the valley of the Red River of the North (p. 96)? What are the uses of wheat? What states on the Pacific coast produce wheat? Name the six leading wheat states in the order of their importance (Fig. 252).

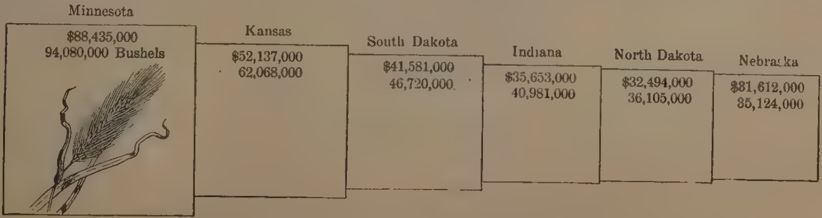


FIG. 252. — The six leading wheat-producing states (1910).

Corn and wheat are our most valuable

food crops. Why is so little of either raised in the western half of the United States (p. 120)? Why so little in New England (p. 38)? What other grains do we raise, and for what is each used?

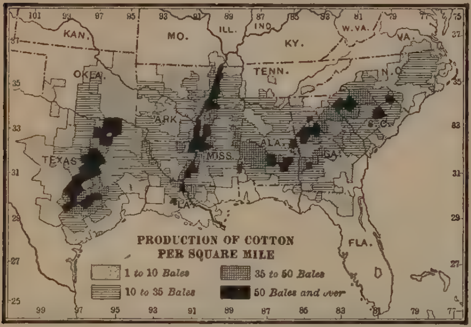


FIG. 253. — Map showing the cotton-producing states.

3. Tobacco According to Figure 256 what states are largely engaged in tobacco growing? What is the appearance of the plant, and how is it prepared for use (p. 52)?

4. Fruits and vegetables Name fruits and vegetables that are extensively raised in the United States. Figure 257 shows the sections that produce large quantities of fruit. What fruits are grown along the coast of the Middle Atlantic States (p. 53)? In Florida, Cuba, and Porto Rico?

Why is the region near the Great Lakes especially suited to fruit raising (p. 97)? What fruits are extensively grown there (p. 97)? Why is truck farming especially important in New England (p. 39)? Where are early vegetables extensively raised (pp. 53 and 77)?

Name and locate the principal irrigated sections in our Western arid lands (Fig. 258). What are their products (pp. 129–133)?

Following are three figures showing the principal states from which other important farm products come: —

5. Other leading farm products How does the value of hay (Fig. 259) in New York compare with that of corn in Iowa, and of wheat in Minnesota? Note that the states raising most corn (Fig. 250) correspond rather closely with those raising most hogs (Fig. 260). Why is that? Name the six leading dairy states (Fig. 261).

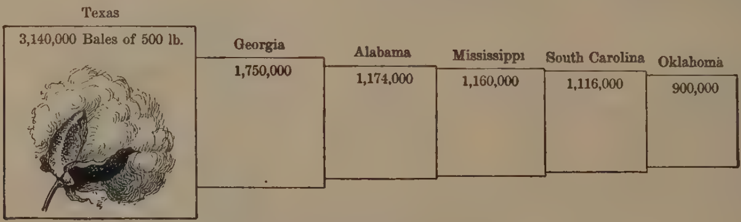


FIG. 254. — The six leading cotton-producing states (1910).

2. Cotton, sugar cane, and rice The cotton belt is confined entirely to the southeastern portion of the country, as shown in Figure 253. Why? Name the principal cotton-raising states and give their rank (Fig. 254). What do you know about the growth and uses of cotton (pp. 74 and 75)?

Where in these states are sugar cane and rice grown? How is each cultivated (pp. 76 and 77)? How does Louisiana rank with our dependencies in the production of sugar cane (Fig. 255)? What are the other sources of sugar? Where is beet sugar produced (p. 75)?

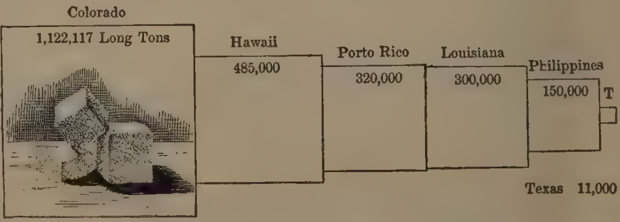


FIG. 255. — The six leading sugar-producing sections in the United States and its dependencies. Colorado, beet sugar; others, cane sugar (1910).

Point out, on the map (Fig. 40), the portions of the country largely given up to grazing. Why these? Relate how cattle ranching is carried on (p. 99); also sheep ranching (p. 133). Which states are most important in these industries (Figs. 262–263)? What are the uses of ranch cattle (p. 110)? Of sheep (p. 134)? In which states are most horses raised (Fig. 264)?

6. Grazing

Figure 265 shows the distribution of the forests in the United States. Describe the industry as it is carried on in Maine (p. 33); in the Southern States (p. 73); in Wisconsin (p. 102); in the Northwest (p. 125). Why these differences? Which are the most common kinds of trees in each section (Fig. 266)? What are the products of the forests besides lumber (pp. 41 and 82)? What states produce the greatest amount of lumber at present (Fig. 266)? Where are the leading forest reserves (p. 126)? Of what value are they?

Lumbering

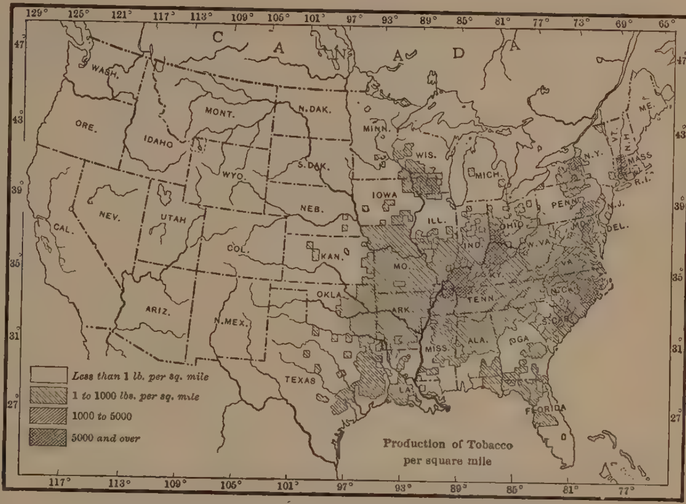


FIG. 256. — Map showing the tobacco-producing states.

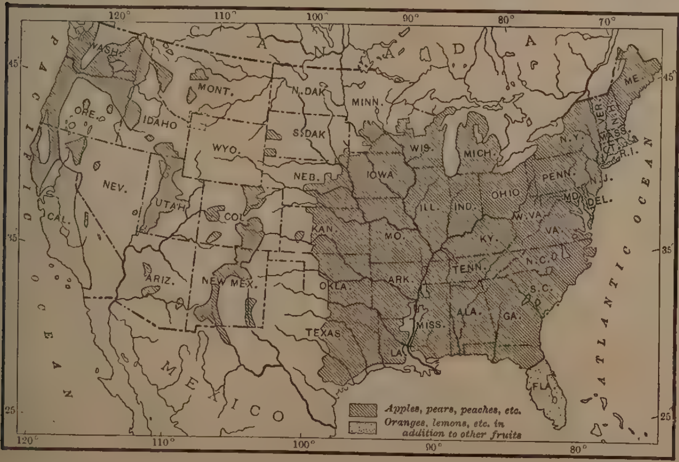


FIG. 257. — Map showing the leading fruit-growing regions of the United States.

In what sections is fishing especially important (Fig. 267)? What fish are caught on our Eastern coast (p. 37)? On our Pacific coast? Tell what you can about the fishing industry in Alaska. Describe how cod fishing is carried on (p. 37); salmon fishing (p. 127); the oyster industry (p. 51).

Fishing

About four hundred thousand men in our country are employed in mining. How many different metals can you name? How many other mineral products can you mention?

Mining

Of all the minerals, the *fuels* are probably the most important. Why? What kinds are there? Figure 268 shows how extensive the *coal beds* are. Name the states in which the greatest

1. The fuels

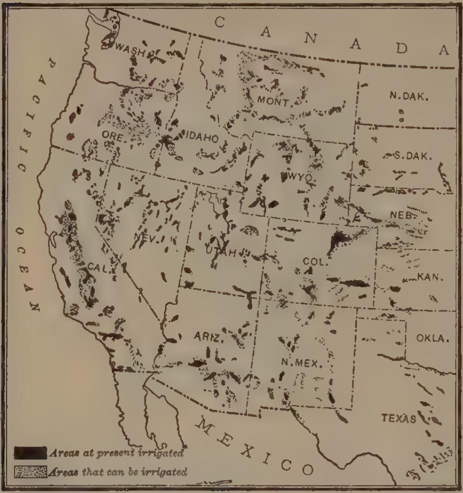


FIG. 258. — Map showing irrigation in United States.

quantities of coal are mined (Fig. 269). Of what importance is it that there are coal fields in so many parts of the country? What kinds of coal are there? What are the differences between them (p. 3)?

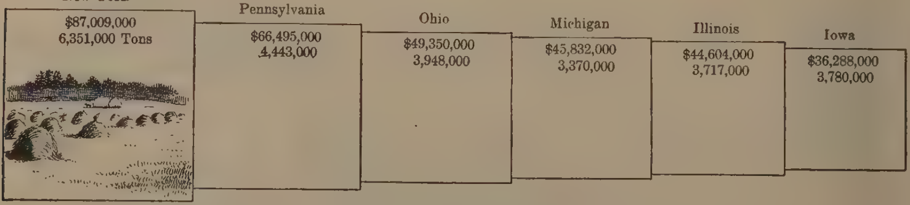


FIG. 259. — The six leading hay-producing states (1910).

Describe a coal mine (p. 55). What are the uses of coal?

Name the chief sections in which petroleum and natural gas are found (Fig. 271). Tell also how they have been produced and what their uses are (p. 56).

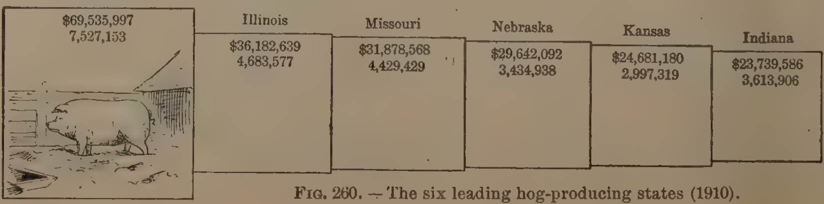


FIG. 260. — The six leading hog-producing states (1910).

2. Iron ore

The ores of iron are among the most important of the mineral products. Why so important? Where are the principal iron-producing regions (Fig. 268)? How is pig iron made (p. 57)? Why is not the Lake Superior district a favorable place for smelting iron ore? Name the six states that lead in production of iron ore (Fig. 270).

3. Precious metals

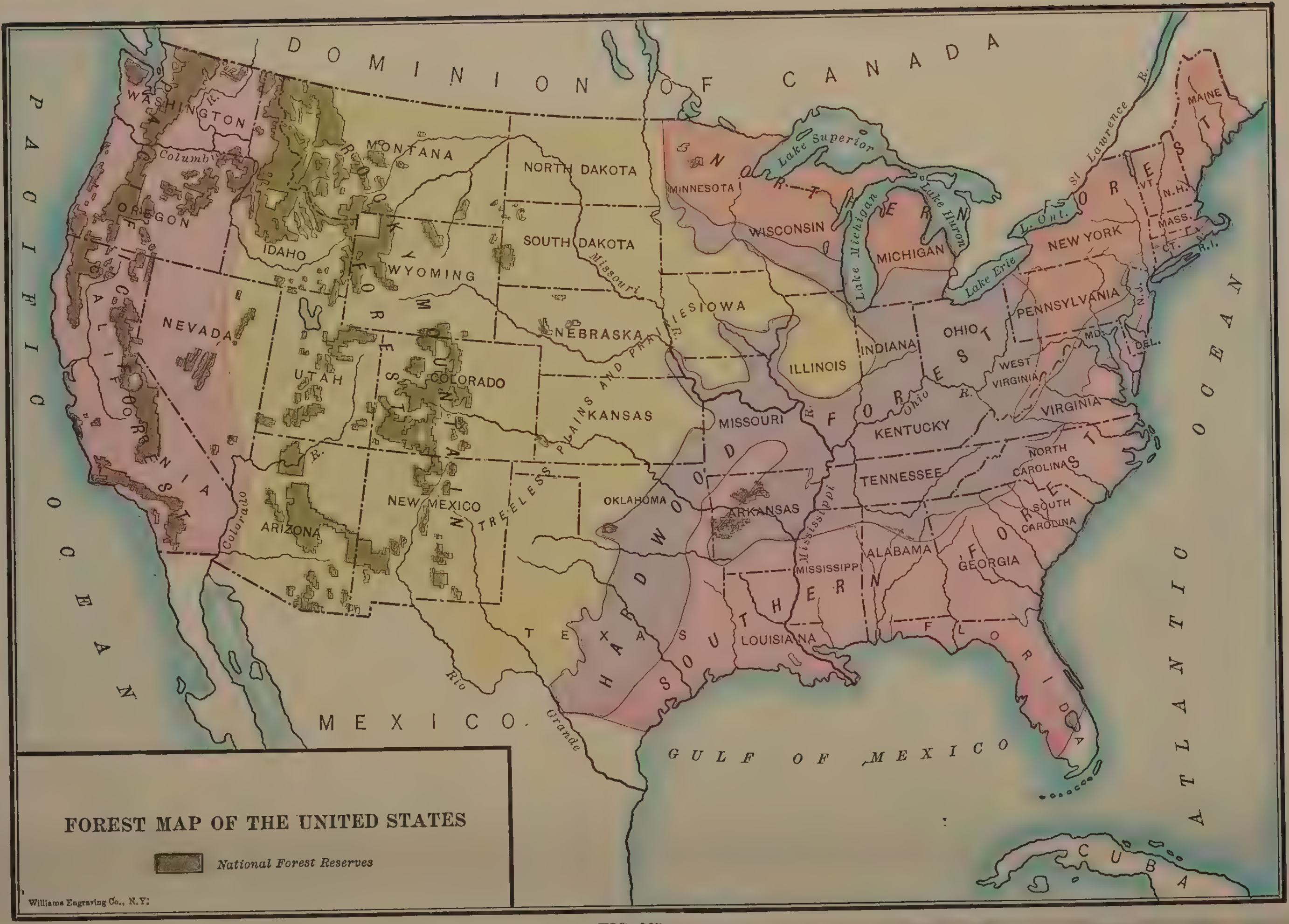
Describe three methods of gold mining (p. 122). What can you tell about gold and silver mining in California and Colorado (p. 123)? In what other parts of our country are the precious metals found (Fig. 271)? How does the value of the gold produced in the six leading states (Fig. 272) compare with that of the silver in the six leading states (Fig. 273)?

4. Other mineral products

What states are most noted for copper mining (Fig. 271)? Describe that industry in the two leading sections (pp. 105 and 124). Where and how is stone quarrying carried on in New England (p. 36)? How is salt obtained in New York (p. 54)? What other valuable mineral products can you name (pp. 57, 80, 106, 123)?

Occupations of country and of city

The four occupations that have been named furnish the *raw materials* for our food, clothing, and shelter. In the main, these four occupations, as stated, lead people to



FOREST MAP OF THE UNITED STATES

FIG. 265.

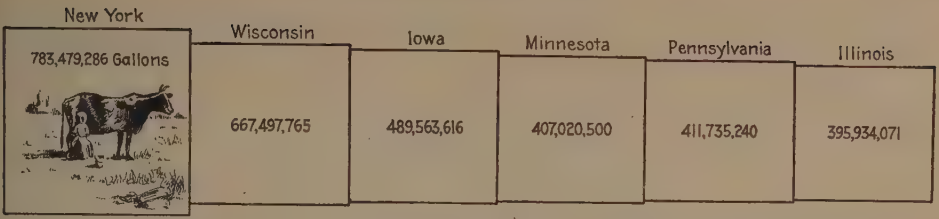


FIG. 261. — The six leading milk-producing states (1910). (Based on statistics giving number of dairy cows and production per cow.)

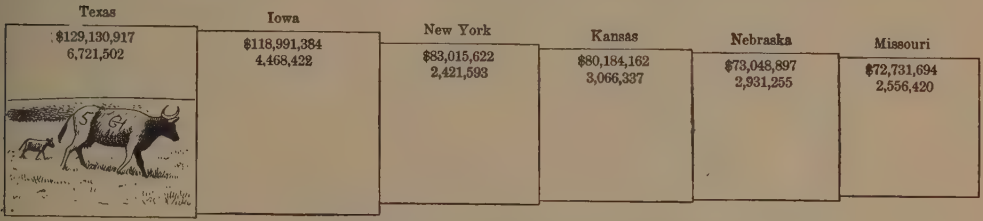


FIG. 262. — The six leading cattle-producing states (1910).

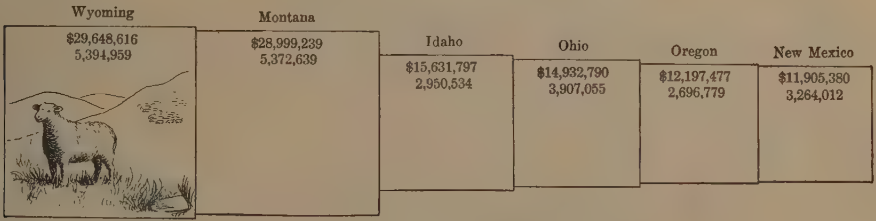


FIG. 263. — The six leading sheep-producing states (1910).

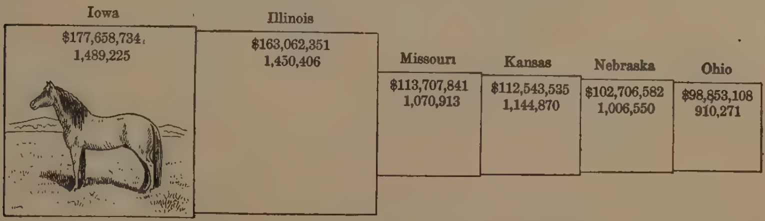


FIG. 264. — The six leading horse-producing states (1910).

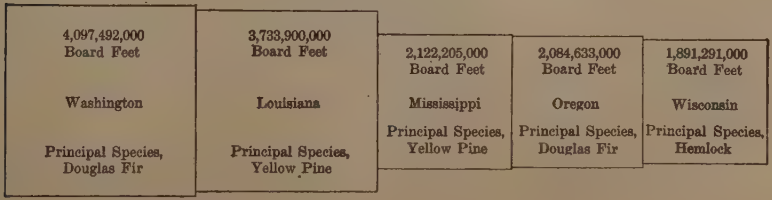


FIG. 266. — The five leading lumber-producing states (1910).

live in small towns or in the country. The three other great occupations require persons engaged in them to live for the most part in cities. These are manufacturing; the transportation of goods; and buying and selling, or trading.

Manufacturing

Figure 274 shows the principal manufacturing sections in the United States. What groups of states do they include? How does it happen that New England very early developed cotton manufacturing, although it raises no cotton (p. 40)? What other kinds of manufacturing are important there (p. 41)? Name several of the leading manufacturing centers there, and tell the kinds of work in each. What states lead in textile manufactures (Fig. 275)? Where are the cotton and wool obtained?

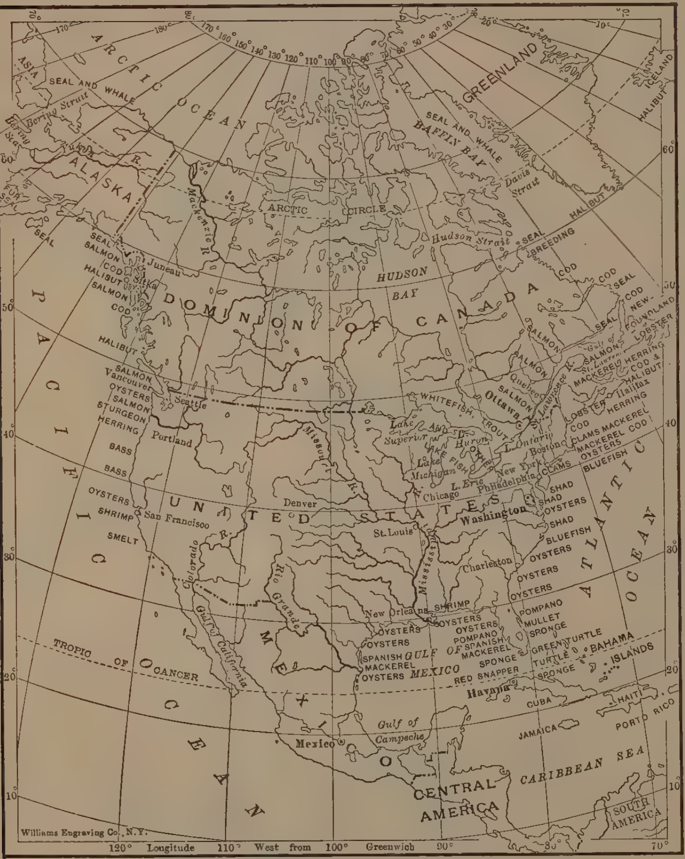


Fig. 267. — Map showing distribution of fish.

What kinds of manufacturing are very important in the Middle Atlantic States, aside from textile goods (p. 57)? What great advantage over New England have those states for manufacturing (p. 54)? What reasons can you give why Pennsylvania leads in iron manufacturing (p. 56)? How are iron and steel made (p. 57)? Name three kinds of iron (p. 58). Name the six leading states in the production of pig iron (Fig. 276). In iron manufacturing (Fig. 277).

Tell about the manufacture of pottery in the Middle Atlantic (p. 59) and in the Central (p. 107) States; about the manufacture of glass (p. 59); of cement (p. 60); of bricks (p. 59).

Tell about the advance in manufacturing in the Southern States (p. 81). What great advantage does Birmingham enjoy for the manufacture of iron goods (p. 82)? Name other important kinds of manufacturing in the Southern States (p. 82). What are the leading manufacturing centers there, and for what goods is each important?

Into what goods are corn, wheat, and barley manufactured in the Central States (p. 106)? Name the great centers for the manufacture of flour (p. 113). What can you tell about the manufactures from forest products in the Central States (p. 106)? For what kinds of manufacturing is Chicago important (p. 109)? St. Louis (p. 113)? Cleveland (p. 112)? Kansas City (p. 114)?

How has the abundance of fruits in the Western States led to much manufacturing (p. 132)? Name some flour-manufacturing center in the Far West (p. 137). Name important centers for smelting of ores (p. 137). For what manufactures is San Francisco important (p. 139)? Portland (p. 140)? Seattle (p. 141)?

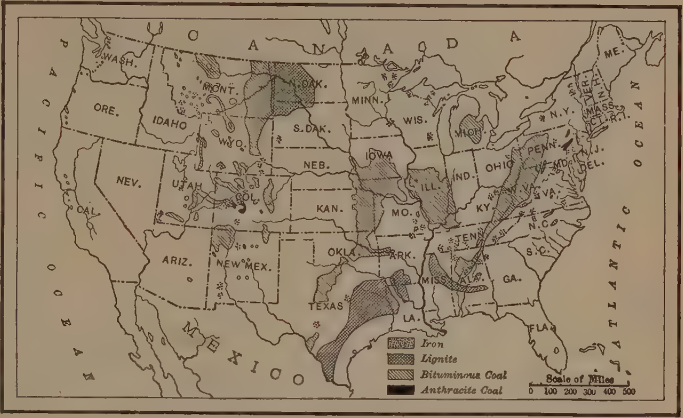


FIG. 268. — Map showing the distribution of deposits of coal and iron in the United States.

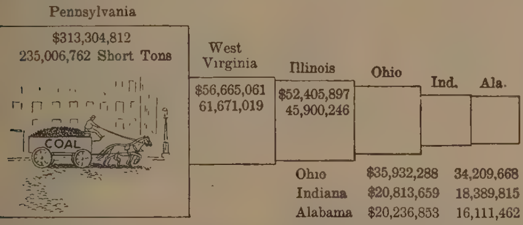


FIG. 269. — The six leading coal-producing states (1910).

Manufacturing employs more workmen in the United States than any other industry, except agriculture. More than seven million men are engaged in it.

The six wealthiest states are shown in Figure 278. Note that all these states are extensively engaged in manufacturing, as shown in Figure 274.

Transportation of goods
. By water

The importance of being able to ship goods by water is clearly shown by the fact that most of our twenty-five largest cities (see Appendix, p. 426) are situated on a water route of some kind. Name the leading harbors along the Atlantic and Gulf coasts. Name those on the Pacific coast (pp. 138–141). Our seven leading ocean ports, in the order of their importance, are New York, Boston, Philadelphia, Baltimore, New Orleans, San Francisco, Galveston. Locate each.

What can you say about the importance of the Great Lakes for shipment of goods? How are these lakes connected by water with the ocean (p. 60)? By examining Figure 279, name the principal navigable rivers in our country.

The Great Lakes carry about twice as much freight as the Mississippi system. Mention some of the principal kinds carried on each.

Where is the Erie Canal? Why has it been so important? Why has it become of less importance than formerly? Where else are canals found (pp. 108 and 167)?

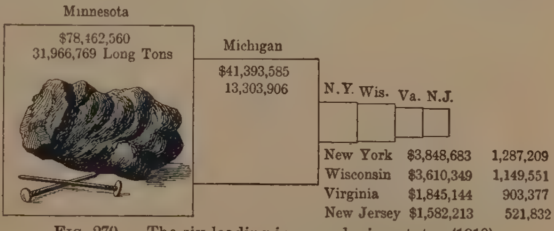


FIG. 270. — The six leading iron-producing states (1910).

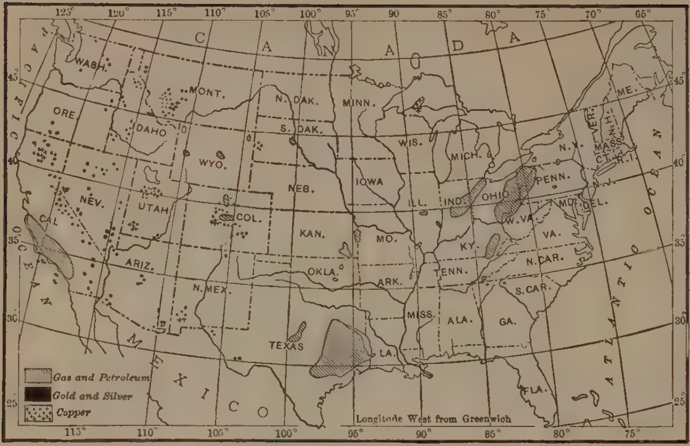


FIG. 271. — Mineral regions of the United States.

2. By rail

Figure 280 shows an enormous number of railways in the United States. They now carry fully three times as much freight as all the water routes together. In what part of the country are most of them found? Why there? Which section is next best supplied with them? Which portion has fewest lines? How does the location of railway lines on this figure compare with the location of cities on Figure 248?

What about the *direction* of a majority of the railway lines? Count the number of railways that extend east and west across the western half of the continent (Fig. 280). In what city on the Pacific coast does each of the transcontinental lines terminate?

The number of miles of railroad that each section of states has, in proportion to its area, is shown in Figure 282. The names of the principal railroads in the East are shown in Figure 281. Note how the roads come together at the great centers of manufacturing and commerce.

Buying and selling, or trade

Trade is the third occupation that attracts great numbers of people to cities. Every one knows that it is important to have stores scattered about over the country, in towns and villages, where one can purchase the articles that he needs from day to day.

But there could not well be such stores unless there were great centers of trade where the storekeepers themselves could buy the goods that they wished later to sell.

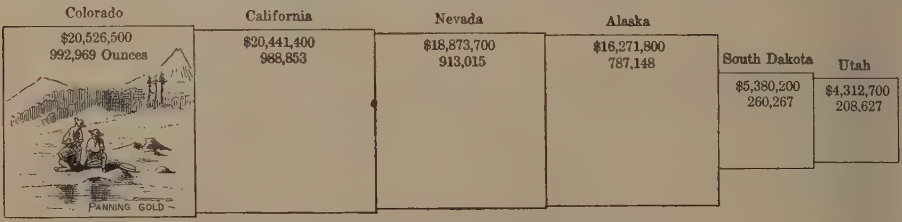


FIG. 272. — The six leading gold-producing states (1910).

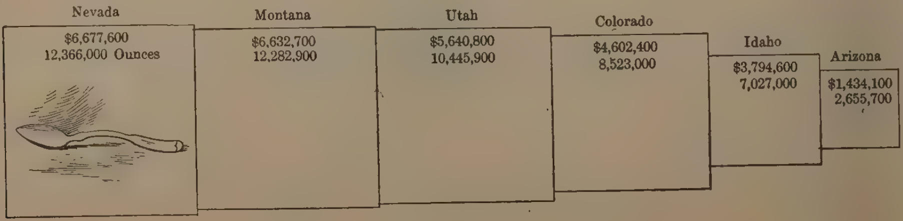


FIG 273. — The six leading silver-producing states (1910).

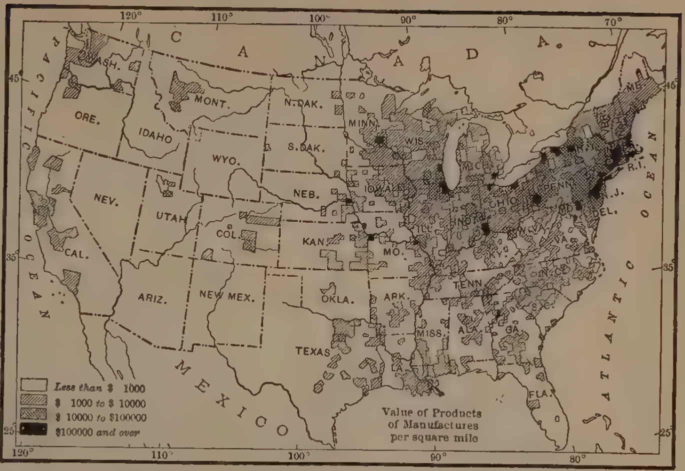


FIG. 274. — Map showing the leading manufacturing districts in the United States.

This is called *wholesale trade*, and is one of the leading occupations in the great cities.

The greatest center for the wholesale trade in our country is New York City. Describe that business there (p. 63). What goods are sold? Name other great centers for wholesale trade, and some of the goods that are sold. What goods are extensively sold in New Orleans (p. 76)? Memphis (p. 86)? Indianapolis (p. 116)? Denver (p. 136)?

Fully four million persons in the United States are engaged in transportation of goods and in trade, or in *commerce*, as these wo kinds of business together are called.

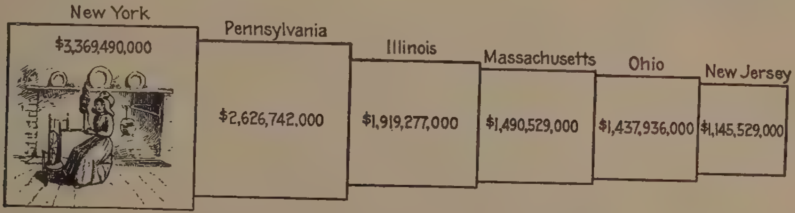


FIG. 275. — The six leading manufacturing states (1910).

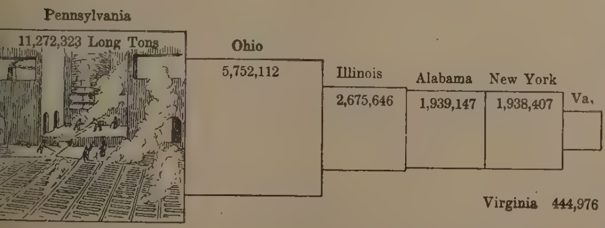


FIG. 276. — The six leading pig-iron-producing states (1910).

Dependence of country and city upon each other

The relation between country and city is ow clear. About one half of our men are ngaged in obtaining raw materials through agriculture, lumbering, fishing, and mining. The remainder are mainly employed in manufacturing these raw materials into useful articles, or in buying, selling, and transporting them. Show by numerous examples how neither class can well do without the other.

Differences in manner of life

Although the two classes are so dependent on each other, the life of one is very different from that of the other. Recall farm life as described on page 93. What idea have you formed of farm life on Southern plantations? Of the ranchman's life (p. 101)? Of the miner's manner of living (p. 122)? The lumberman's (p. 34)? The fisherman's (pp. 38 and 127)?

Recall, on the other hand, what was said about life in New York City (p. 64). Give your idea of factory life; of life in trade and transportation. Which of these several occupations do you consider most attractive? Which least attractive?

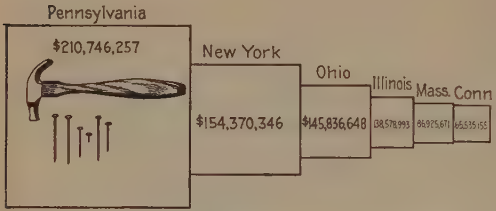


FIG. 277. — The six states leading in iron manufacturing (1910).

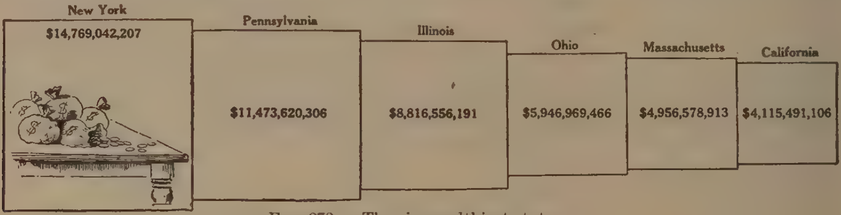


FIG. 278. — The six wealthiest states.

It is difficult to say which occupation requires the hardest work, for success demands one's best effort, no matter what the occupation may be. But which are more sure of simple food, clothing, and shelter, those living in the city or those in the country? Why? Which are more independent in general? Why? Which have the better opportunities for amusement? Why? For education? Why? For homes with plenty of light and fresh air? Why?

For many years the population of cities has been increasing more rapidly than that of the country, which suggests that people prefer city to country life. Can you give any reasons for this, in addition to those already mentioned?

Dependence of different sections upon one another

No one place produces all the materials needed there. Which of your foods are not raised near your home? How about the knives, forks, dishes, and spoons? How about the clothes that you wear?

Because of the climate, water power, soil, or for some other reason, each part of the country is especially fitted for producing one or several things; for instance, eastern Kansas for grain, western Kansas for stock, northern Maine for lumber, etc. Indeed, most of the articles used in each part of the country must be brought from other places.

Name the materials that the Montana ranchman needs from the Southern planter; from New England; from Minneapolis and Chicago. Upon what parts of the United States are the inhabitants of Florida dependent? What do they supply in return? Make a list of the materials used in the building of your house; and, as far as possible, determine where each one may have come from.

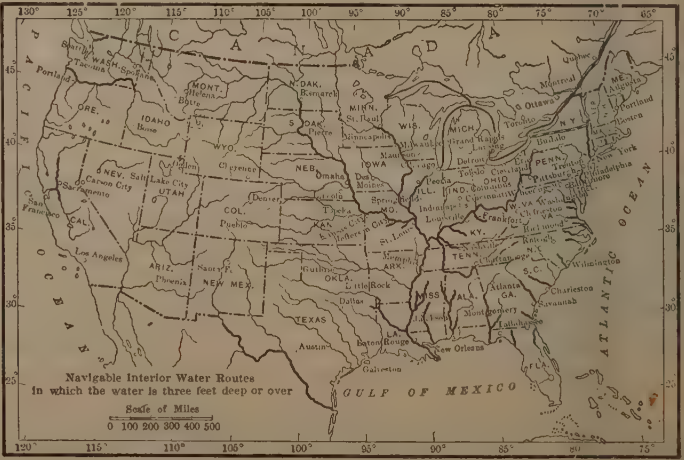


FIG. 279. — Map to show the navigable interior water routes of the United States.

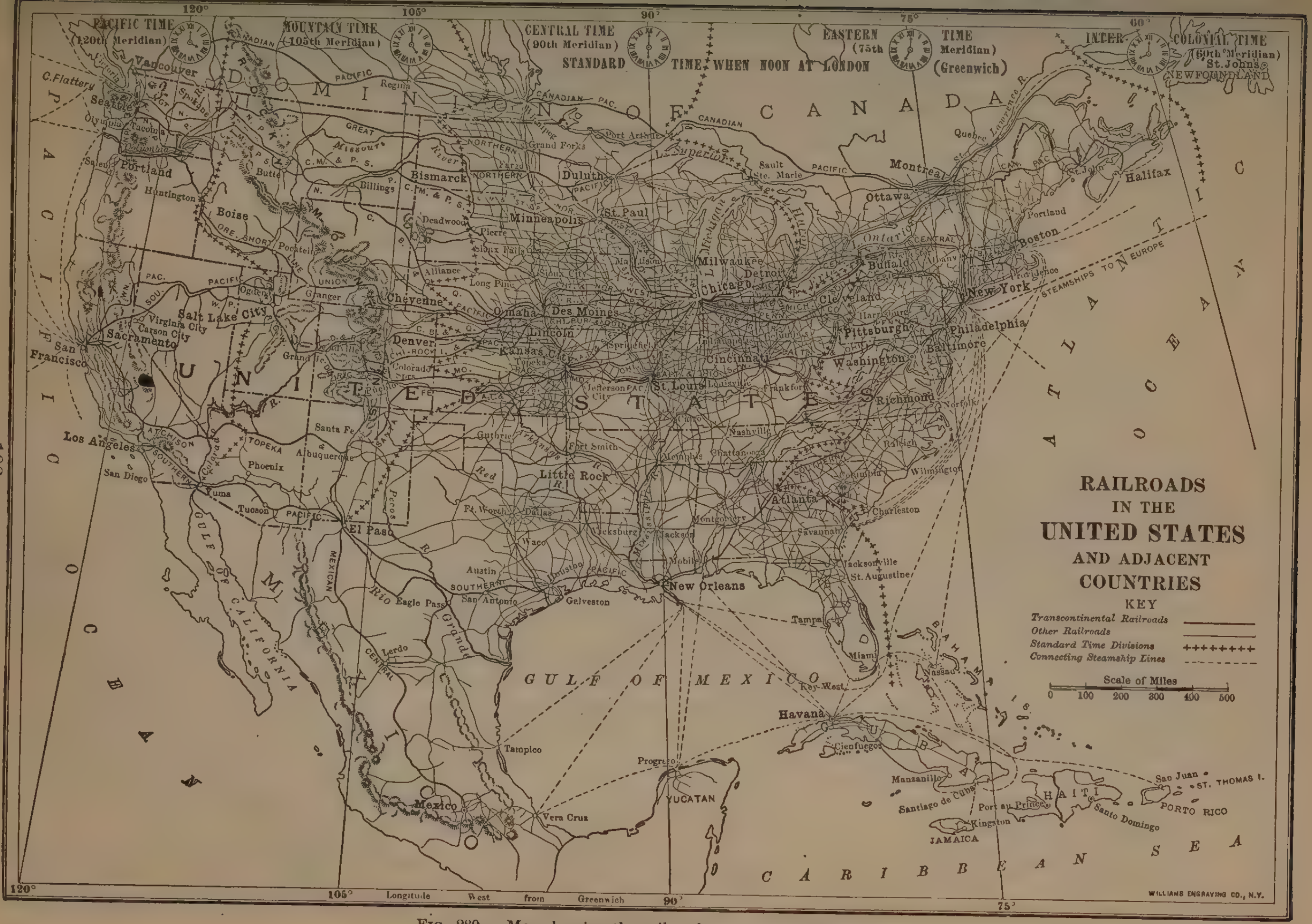

RAILROADS IN THE UNITED STATES AND ADJACENT COUNTRIES
KEY
Transcontinental Railroads
Other Railroads
Standard Time Divisions
Connecting Steamship Lines
Scale of Miles
0 100 200 300 400 500
PACIFIC TIME (120th Meridian)
MOUNTAIN TIME (105th Meridian)
CENTRAL TIME (90th Meridian)
STANDARD TIME WHEN NOON AT LONDON
EASTERN (75th Meridian) TIME (Greenwich)
INTER-COLONIAL TIME (60th Meridian)
DOMINION OF CANADA
UNITED STATES
MEXICO
GULF OF MEXICO
CARIBBEAN SEA
PACIFIC OCEAN
ATLANTIC OCEAN
GULF OF CALIFORNIA
STEAMSHIPS TO EUROPE
Longitude West from Greenwich
120° 105° 90° 75° 60°
WILLIAMS ENGRAVING CO., N.Y.

FIG. 280. — Map showing the railroads of the United States.

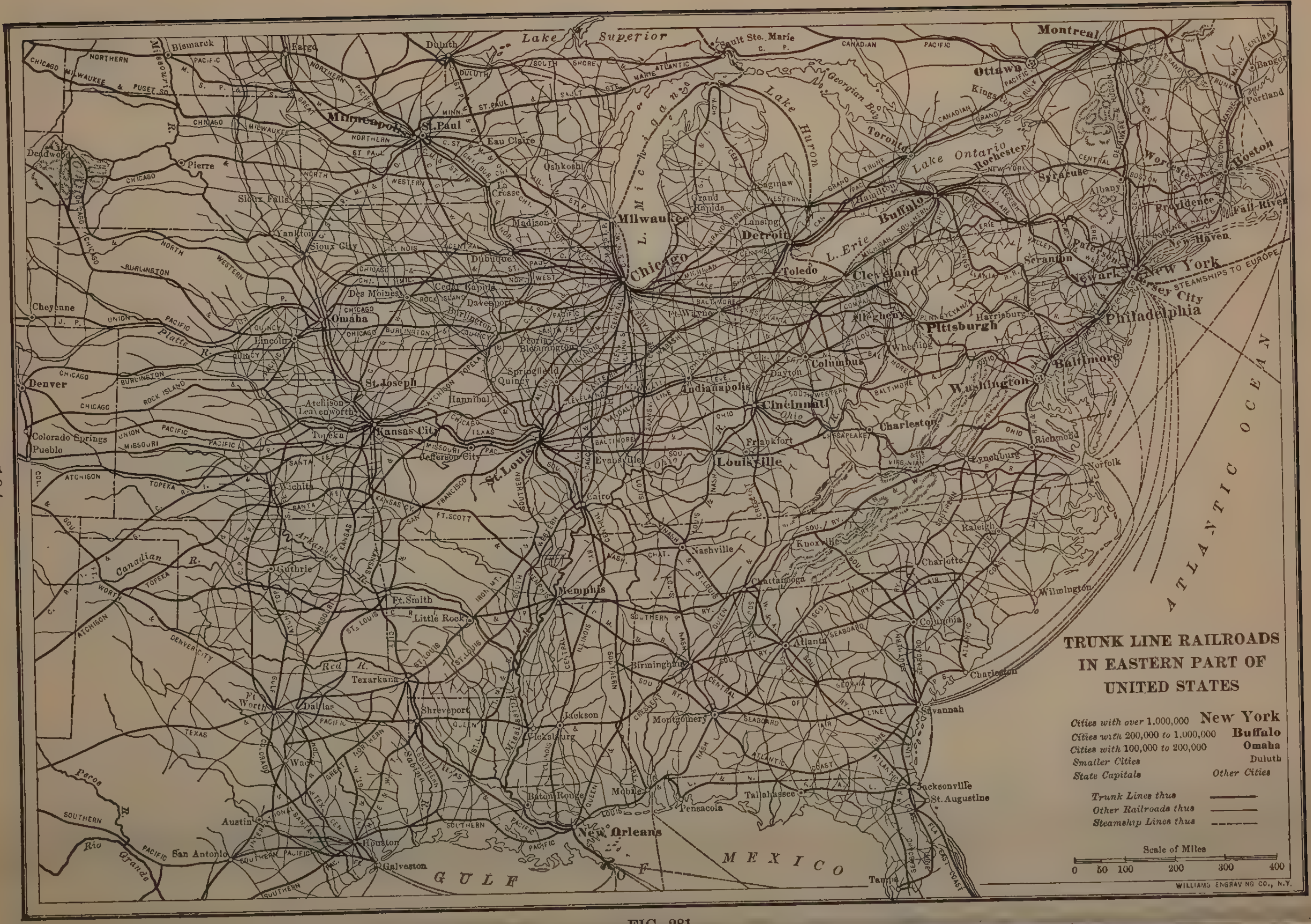

TRUNK LINE RAILROADS IN EASTERN PART OF UNITED STATES
Cities with over 1,000,000 New York
Cities with 200,000 to 1,000,000 Buffalo
Cities with 100,000 to 200,000 Omaha
Smaller Cities Duluth
State Capitals Other Cities
Trunk Lines thus
Other Railroads thus
Steamship Lines thus
Scale of Miles
0 50 100 200 300 400
WILLIAMS ENGRAVING CO., N.Y.
ATLANTIC OCEAN
GULF OF MEXICO
STEAMSHIPS TO EUROPE
Lake Superior
L. Michigan
Lake Huron
Georgian Bay
Lake Ontario
L. Erie
Montreal
Ottawa
Kingston
Toronto
Sault Ste. Marie
Bangor
Portland
Boston
Worcester
Providence
Fall River
New Haven
New York
Jersey City
Newark
Paterson
Albany
Syracuse
Rochester
Buffalo
Hamilton
Scranton
Philadelphia
Harrisburg
Baltimore
Washington
Pittsburgh
Allegheny
Wheeling
Cleveland
Toledo
Detroit
Lansing
Saginaw
Grand Rapids
Columbus
Dayton
Cincinnati
Charleston
Richmond
Norfolk
Lynchburg
Raleigh
Wilmington
Charlotte
Columbia
Charleston
Savannah
Jacksonville
St. Augustine
Tampa
Tallahassee
Pensacola
Mobile
Montgomery
Atlanta
Birmingham
Chattanooga
Knoxville
Nashville
Louisville
Frankfort
Evansville
Indianapolis
Ft. Wayne
Chicago
Milwaukee
Madison
Oshkosh
La Crosse
Eau Claire
St. Paul
Minneapolis
Duluth
Fargo
Bismarck
Pierre
Deadwood
Sioux Falls
Yankton
Sioux City
Dubuque
Cedar Rapids
Davenport
Des Moines
Burlington
Peoria
Bloomington
Springfield
Quincy
Hannibal
St. Louis
Jefferson City
Cairo
Memphis
Jackson
Vicksburg
Baton Rouge
New Orleans
Shreveport
Texarkana
Little Rock
Ft. Smith
Kansas City
St. Joseph
Atchison
Leavenworth
Topeka
Wichita
Guthrie
Omaha
Lincoln
Cheyenne
Denver
Colorado Springs
Pueblo
Dallas
Ft. Worth
Waco
Austin
San Antonio
Houston
Galveston
Missouri R.
Platte R.
Arkansas R.
Canadian R.
Red R.
Sabine R.
Pecos R.
Rio Grande
Ohio R.
Mississippi R.

FIG. 281.

From these facts it is plain that the dif- erent parts of the country are of vital im- ortance to one another, much as different arts of the body are.

ur relation o our depend- ncies

In spite of our broad territory, and the normous number of our products, there are some necessary articles that are either entirely lacking, or cannot be produced in sufficient uantities within ur own borders. ame a few. (See able of Imports, . 411.) Mention ome that we are herefore glad to re- eive from Alaska; uba; Porto Rico; he Hawaiian Is- nds; the Philip- ines. Mention others that they, likewise, e glad to receive from us. State, then, ow the United States and its dependencies e of advantage to each other.

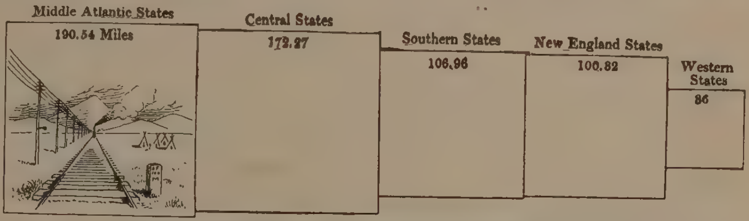


FIG. 282.—The figures represent the number of miles of railway for every one hundred square miles of territory in each of the five groups of states (1910).

2. Other Countries of North America

nada and ewfoundland

The principal industries in southern anada and Newfoundland are similar to those in our Northern States. What about agriculture there). 165)? Where is coal mined (p. 166)? recious metal (p. 166)? What about razing (p. 165)? Lumbering (p. 163)? ishing and sealing (p. 164)? Compare e raw products of southern Canada ith those of our Northern States. Name d locate the principal cities; the lead- g trade route. Mention the chief nds of manufacturing. (For above, see 168).

exico

Describe the surface of Mexico (p. 171). he climate (p. 172). What are the agricultural products from its arid plateaus (p. 173)? From its wlands (p. 174)? From the slopes be- een (p. 174)? Tell about the forests of exico (p. 172); the mining (p. 175). ive some reasons why there is so little manufacturing in that country (p. 175). Locate the principal cities.

Central America and West Indies

Name the six republics of Central America. Describe the surface of the country and the climate (p. 177). Name the principal industries (p. 178). Tell about the canal across the isthmus (p. 154).

Mention the largest islands among the West Indies. What are their chief industries (p. 178)?

3. Relation of United States to Other Countries

Need of our sending away some goods and receiving others

What industries in the United States are not found, or are little developed, in Canada? In Mexico? In Central America? What industries in any one of the latter countries are not found in the United States?

As in the case of any single locality, the United States as a whole produces far more of some materials than our people can consume. Other important articles must come wholly, or in part, from abroad. Give examples of each.

If we could not secure a market for our products in foreign lands, we should suffer greatly; and if foreign countries did not provide us with what we need, we should suffer again. Other countries are in the same condition. Show how that is true of Canada; of Mexico. There is excellent reason, therefore, for a constant exchange of goods among the nations of the world.

How does the size of our country give us a great advantage in this respect?

The goods that we send forth are called *exports*, and those brought in, *imports*. Examine the tables of exports and imports on pp. 410 and 411 to see some things that we send away and receive, as well as the countries with which we trade.

The names of such goods, and their value

More than half of all our exports and imports are sent by way of New York. Why? Other ports next in importance have already been named (p. 189). What are their names? The total value of our exports in 1911 was $1,536,561,442; of our imports, $824,620,160.

Some imports are allowed to enter the country free; but upon most of them there is a *duty;* that is, a charge for entering our country. This duty is a source of income, or *revenue*, for the government. It is also intended to protect our industries by preventing foreign products from being sold in our country at a lower rate than we can produce them.

Meaning and object of "duties"

However, this sometimes causes hardship. For example, a citizen of the United States, living near the border of Canada, cannot buy lumber and wood pulp from that country without paying a duty upon them. This causes us to pay a higher price for many articles than we would have to pay if no duty were placed upon them. Under such conditions the boundary line between two neighboring countries becomes of real importance as a hindrance to free trade.

4. Value of Steam and Electricity in Development of North America

The use of steam upon the water ways and railways has been of the greatest influence in the development of our country. A century ago it required two days to travel from New York to Philadelphia, and six days from New York to Boston. In the latter case only two trips per week were made by stage. The journeys were not only very tiresome, but were often dangerous.

Advances made in a century

At that time there were but thirteen daily papers in the United States, and neither papers nor books could be sent by mail. Letters cost from six to twenty-five cents, according to the distance; and because the expense of carrying them was great, they were not sent from the smaller towns until a sufficient number were collected to make it worth while.

Now we can travel as far in an hour as our forefathers could in a day, and with much more comfort. There are over two thousand daily papers, and these, as well as letters, may be sent quickly and cheaply to every section of the country. We can send a telegram to a distant point in an instant, and can talk by telephone with a person hundreds of miles away, even recognizing the tones of his voice. How wonderful these facts would have been to persons living a hundred years ago!

The effect of such a mighty change is seen in every direction. Each year thousands of car loads of fruit are shipped to Eastern cities from California. If there were no railways, how could such fruits reach these cities? What, then, would be the effect on southern California? Also, how could the corn of the Central States be marketed? And how could furniture, sugar, and coffee be brought to the Western farmer's door? Trace other results of this change.

Influence of these advances on our mode of life

If our railway trains and steamboats should all suddenly stop running, there would be a famine in every large city within a few days. Even now, when heavy falls of snow block the trains for a day or two, the supply of milk, meat, and other foods quickly runs low, and the prices rise to several times their usual value.

If we had no railway trains, there might also be extensive famines over large areas of country, as there were in Europe in the olden times, and as there are even at present in China. Why in China? As it is, however, hundreds of articles of food and clothing are quickly brought from distant points. Mention several such articles. No one section is in danger of suffering from want of food, because if the supply fails there, it is easily obtained from other sections.

The effect of steam and electricity on the industries and inhabitants of cities is striking. Many persons living scores of miles away do much of their shopping in the cities. Owing to trolley lines, elevated railways, and other means of rapid travel, those engaged in manufacture or commerce are able to live many miles from their places of work, and thus secure more healthful homes in the suburbs. Because so many people are able to have their homes in the suburbs, the cities are not nearly so overcrowded as they might otherwise be.

Their influence on government

When our Union was formed, more than a century ago, many wise persons believed that it was bound to be a failure. Our population was so scattered (Fig. 43) that people living in one part were likely to know and care little about those in other distant parts. It seemed probable that quarrels and wars would arise, due to differences of opinion, and therefore that our republic might be split into several rival countries.

Just the opposite has happened. Our people are closely united in interests, and are working well together. At the same time our boundaries have been so enlarged as to include far more territory than was at first thought possible (Fig. 283).

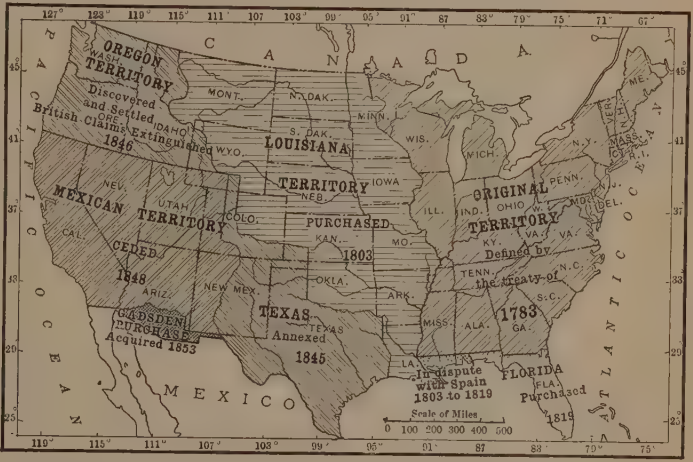


FIG. 283.—Map to show when and how the United States obtained its territory.

Aside from that, millions of foreigners have settled in our country since 1821, representing all the principal races of mankind (App., p. 432), and many of the leading languages, religions, and political beliefs of the world. In spite of all this, we have kept in such close touch with one another that our Union has grown stronger and stronger.

Each day, by rail and water, articles are sent to all parts of the country. In all the states the people read the same news every morning; and whatever books are found especially valuable in one section quickly become known in others. Thus we not only enjoy far better opportunities for education than formerly, but we learn to *know* one another; we have the same thoughts, and we feel a common sympathy. So far as meeting and understanding one another are concerned, our country is really far smaller than it was a hundred years ago; we are living together like one very large family.

The governments of Canada and Mexico are unions of many states, much like our Union; and the benefits that they have received from steam and electricity have been similar to our own.

PART II. GENERAL GEOGRAPHY

I. The Earth

Form and size of the earth

The earth is a sphere with a circumference of about twenty-five thousand miles, and a diameter of nearly eight thousand miles. It is slightly flattened at the poles, however. For this reason, the line which extends through the center of the earth from pole to pole — called the *earth's axis* — is a little shorter than the diameter at the equator.

Proofs that it is round

The earth is known to be round like a ball, not only because people have traveled around it, but also because its shadow, as seen in an eclipse, is always round. A sphere is the only body that will always cast a round shadow. Can you give another proof that the earth has the form of a sphere?

Its daily motion, and the results

The earth is rapidly turning, or rotating, about its *axis*. This motion has very important results. In the first place it causes sunrise and sunset. When we glance out of the window of a moving car, the objects that we pass often appear to be moving in the direction opposite from that in which we are traveling. It seems as though we were standing still. In a similar way the rotation of the earth causes the sun to *appear* to move; to appear to rise and set. Indeed, for a long time people believed that it was the sun that moved, and not the earth.

Since we first see the sun in the east, it is plain that the earth is rotating eastward; that is, from west to east. This rotation gives us the light of the sun for a few hours, and then brings darkness. Thus it causes day and night. And since one rotation lasts twenty-four hours, it gives us a day of that length.

It was stated before that the circumference of the earth is about twenty-five thousand miles. How far, then, must a point on the equator move in one hour? In one minute?

By rotating a globe, or an apple, in the sunlight, show how day and night are caused on the earth. Hold the sphere still; what would be true about daylight and darkness on the earth if it did not rotate at all? What might be the effect upon life on the earth if the same side were always toward the sun?

The yearly motion of the earth

The earth has another motion that is of very great importance. This is its *revolution* around the sun, which is illustrated in Figure 284. The object shown in the center of the circle is the sun, as you see, and the circle itself shows the course that the earth takes in its revolution.

At the same time that the earth is whirling on its axis, it is also forever swinging around the sun, although the sun is ninety-three million miles from it. It takes a year to complete one revolution. Indeed, the time necessary for this great journey is what fixes the length of our year. The path, or *orbit*, that the earth takes is here represented as a circle, although, in fact, the earth's path is not a perfect circle.

Importance of the forces called gravity and gravitation

In its revolution, the earth is moving at the rate of more than one and a half million miles per day. What fearful speed! And this, too, while it is whirling, or rotating, on its axis! One might ask, "With such rapid motion, why are we not swept from the earth by the wind?" The answer is that the air, as well as everything else upon the earth, is drawn toward the earth and held in place by the force called *grav-*

ity. It is on account of this force that everything on the earth turns with it, in the daily rotation, and swings around with it in its annual revolution.

Again, if the earth is revolving at such speed, why does *it* not fly away into space? As a stone swinging round at the end of a string flies off when the string breaks, so it might seem that the earth would fly off into space; for there *appears* to be nothing holding it to the sun.

As a matter of fact, there *is* something holding it. It is not a string, nor a rope, to be sure, but something far stronger. The sun is very much larger than the earth; in fact, it is over a million times as large. It attracts the earth, and holds it in place, in much the same way as the force of gravity attracts men and houses to the earth. This *attraction of gravitation,* which the sun exerts upon the earth, is what prevents our sphere from flying off into space; it holds the earth as firmly as the string holds the stone.

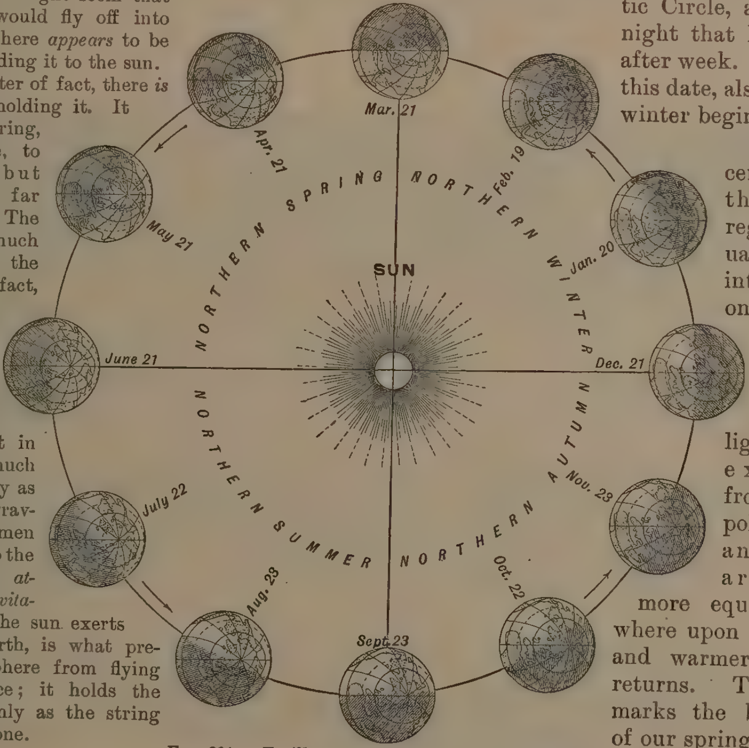


FIG. 284. — To illustrate the revolution of the earth around the sun. The shaded portion represents night. The end of the axis around which the earth rotates is the point where the lines come together.

Effects of the earth's revolution

The revolution of the earth is what causes our seasons and the changing length of our day and night.

In Figure 284 the lowest sphere, bearing the date September 23, represents the earth as receiving the light of the sun from pole to pole. On that date day and night are equal everywhere upon the earth. It marks the end of summer and the beginning of our autumn.

Following the earth in its revolution (to the right), we find that, as the months pass, the north pole falls farther and farther into the shadow, until the farthest point is reached on December 21. That is the date for our shortest day and longest night. Farther north the nights are longer still,[1] and the Eskimos, who live within the Arctic Circle, are having night that lasts week after week. It is upon this date, also, that our winter begins.

After December 21, the Arctic region gradually comes into the light once more, until, on March 21, the sun's light again extends from pole to pole. Day and night are once more equal everywhere upon the earth, and warmer weather returns. That date marks the beginning of our spring.

Going farther, on June 21, the north pole is shown to be just as far within the light as it was within the shadow on December 21. This is the date for our longest day and shortest night. Farther north, the days are longer still, and within the Arctic Circle the day lasts week after week. It is upon this day, also, that our summer begins.[2]

[1] Exactly at the north pole there are six months of day and then six months of night.

[2] Some teachers may wish to introduce here an explanation of the effects of inclination of the earth's axis, and a more complete study of the seasons. This has not been included in this book because it is felt that,

After this date, until September 23, the continued revolution of the earth gradually brings the north pole again toward the shadow. Then, on September 23, the light of the sun once more extends from pole to pole, so that day and night are again equal, and a year is completed.

Thus the seasons follow one another, and our days and nights constantly change in length. And it is all because, as the earth revolves about the sun, the part of the earth that receives the sun's rays is continually changing.

While these changes are in progress in the northern hemisphere, there are also changes in the season, and in the length of day and night, in the southern hemisphere. These changes are of the same kind, but the seasons are exactly changed around; that is, it is winter there when it is summer with us; and when the north pole is in darkness, the south pole is bathed in the sunlight.

Cause of the zones, and their boundaries

Figure 285 shows the zones on the earth. How many are there? Name and locate each. The cause of the zones is found in the slant at which the rays of the sun strike the earth. In the torrid zone they are always either vertical, or nearly so. In the temperate zone, they strike the earth at a greater slant; and in the frigid zones at a much greater slant still. On this account, the heat grows less and less as one approaches either of the poles.

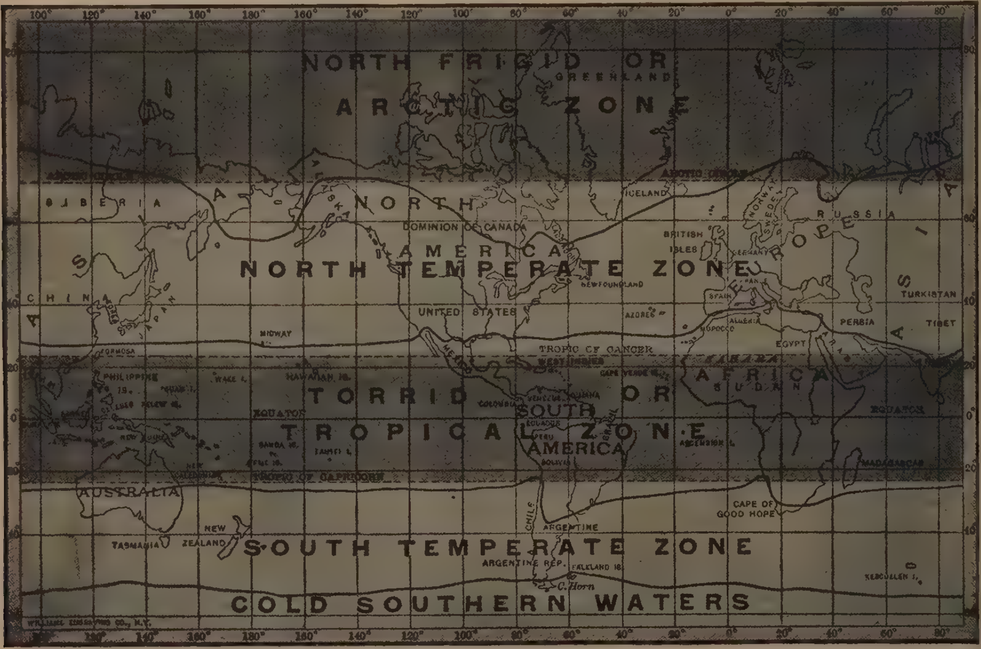


FIG. 285. — A map of the zones.

The boundaries of the *tropical* (*torrid*) *zone* are easily fixed, because they mark the points farthest north and south where the sun's rays are vertical at some period of the year. On December 21, when the north pole is farthest within the shadow (Fig. 284), the sun's rays are vertical as far south as the Tropic of Capricorn. On June 21, on the other hand, when the north pole is farthest within the light, the sun's rays are vertical as far north as the Tropic of Cancer.

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unless the teacher has the necessary apparatus, a mere study from the text is too difficult. The authors believe that it is a subject that is better fitted for the high school age.

The *north frigid* (Arctic) *zone* is the region around the north pole that lies entirely in darkness on December 21. On June 21, this same region lies entirely in the light. The *south frigid zone* is the corresponding region about the south pole.

The two *temperate zones* are merely the wide belts that lie between the torrid zone, on the one hand, and the frigid zones on the other. There is one, called the *north temperate zone*, in the northern hemisphere, and another, called the *south temperate zone*, in the southern hemisphere.

Name the boundaries of each of the zones. It is convenient to use such boundaries; but there is really no sharp difference on the two sides of any one of them. Indeed, the real boundaries are quite irregular (Fig. 285); for in some parts of the temperate zone there is a very hot climate; and on the highlands of the tropical zone, the climate is often temperate, or even frigid. These are exceptions, however, and generally the climate is torrid in the tropical zone, temperate to the north and south of it, and frigid around the poles.

How the earth's revolution causes our seasons

Our seasons are likewise due to the slant at which the sun's rays strike the earth at different times of the year. On December 21, the midday sun is low in the heavens, in the region where we live, and then its rays reach us at the greatest slant. That, then, marks the beginning of our coldest season. On June 21, on the other hand, the midday sun is high in the heavens, and the rays are then most nearly vertical. That, then, marks the beginning of our warmest season. Spring comes as the rays become more nearly vertical; and autumn as they grow less so.

How the revolution affects our daily lives

The revolution of the earth around the sun is, therefore, of the greatest importance. It causes our seasons by continually changing the slant at which the sun's rays fall upon us. That affects us in a thousand ways. It determines, for instance, the time when our lamps shall be lighted, when crops shall be planted and harvested, and when the navigation of many of our rivers and lakes shall be opened and closed. It even leads to changes in the kind of clothes that we wear, and greatly influences the sports that we enjoy. Name some of its other influences.

Review Questions

1. State the form and size of the earth. 2. Give proofs that it is round. 3. Tell what you can about its daily motion, and the results. 4. What is its yearly motion? 5. How are gravity and gravitation important forces? 6. State the effects of the earth's revolution. 7. State the cause of the zones. 8. Of their boundaries. 9. How does the earth's revolution cause our seasons? 10. How, then, does this revolution influence our daily lives?

Suggestions

1. Show by a globe, or a ball, how the two movements of the earth, rotation and revolution, can be going on at the same time. 2. Are the days growing longer or shorter at present? 3. During which months do they grow longer? During which months shorter? 4. At what time of day does your shadow always point directly north? 5. Notice how your shadow changes with the season in early morning; at noon; in the evening. 6. Tell about the direction and length of a man's shadow at noon on December 21 at various points between the poles. 7. On June 21. 8. On September 23. 9. How long is our longest night? Our shortest? 10. Which zone has the slightest change of seasons? Why? 11. Is it once or twice each year that the vertical rays of the sun fall upon any one place in the torrid zone?

II. Latitude, Longitude, and Standard Time

1. Latitude and Longitude

Need of some way of locating places exactly

In a study of geography, it is often necessary to locate places exactly. This is not so easy as it might seem. For instance, suppose we wish to state where London is situated; how would it be done? Of course, by taking a long time, it would be possible to describe the general location of this city; but some more accurate way should be found.

How houses are located in cities

The difficulty is much the same as that which arises in locating a place in a large city, where there are thousands of houses. No one person knows who lives in most of them, and if a stranger were looking for a friend, he might have much trouble in finding his house.

A very simple means has been found for locating city houses. For example, a street running east and west may be selected to divide the city into two parts, as Washington Avenue does in Figure 286. Any place north of this street is spoken of as being on the *north side;* any place south of it as being on the *south side.* The streets to the north of this central street are numbered as North 1st, North 2d, North 3d, etc.; those to the south of it as South 1st, South 2d, South 3d, and so on. Then if a man says that he lives on North 4th Street, we know at once that he lives on the north side, and that his house is on the fourth street from this central one.

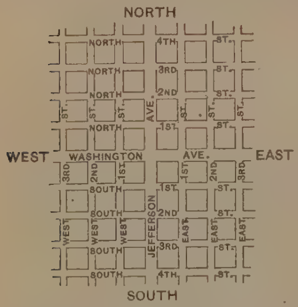

FIG. 286. — Map of a part of a city, to illustrate the need of naming streets.

But we need also to know on what *part* of North 4th Street this house is to be found. To answer that question, another street running north and south, and crossing the east and west ones, may be selected to divide the city into east and west parts. In Figure 286, Jefferson Avenue is such a street. The streets on the two sides of it are numbered as East 1st, East 2d, West 1st, West 2d, etc. (Fig. 286).

Then if a man lives on the corner of North 4th and East 3d streets, we know not only that his home is *north* of a certain line, but *east* of a certain other line. If the *blocks*, as the spaces between two streets are called, are always the same, it will be easy to tell the distance from each of the central streets to the house. Thus the house can be located *exactly*.

Such a plan is not necessary in small towns and villages, because the people there know one another, and are able to direct strangers easily. Few, if any, cities follow *exactly* the scheme here given; but all have a plan somewhat similar to this. If you live in a city, perhaps you can tell just how houses are located there.

How places can be exactly located on the earth

1. How they can be located in a north and south direction

Places upon the earth are located in much the same manner as in the city just described. The *equator*, which extends around the earth midway between the poles, corresponds to the dividing street (Washington Avenue) that runs east and west. The distance between the equator and the poles, on either side, is divided into ninety parts (Fig. 287), corresponding, we might say, to the blocks in a city. The earth is so large, however, that these "blocks," or parts, are very much larger, each being about sixty-nine miles wide. That distance is called a *degree*, and the sign for degrees is a little circle (°) placed at the right of a figure. (For example, 60° means 60 degrees.)

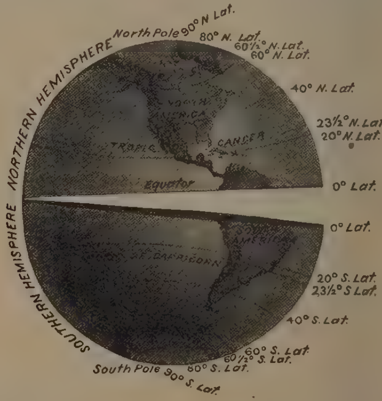

FIG. 287. — The globe, showing the two hemispheres and some of the circles of latitude.

Lines are drawn upon maps and globes to represent these degrees. The lines on a globe extend completely around it from east to west, and are therefore circles. The first circle north of the equator, marked 1°, is about sixty-nine miles from that dividing line; the one marked 2° is twice that distance, and so on. The north pole is 90°

from the equator. The same plan is followed south of the equator; and the south pole is also 90° from the equator. Thus the distance from pole to pole is 180°.

All points on any one of these circles are the same distance from the equator, and from each of the other circles. That is, the circles are parallel with one another; and on that account they are called *parallels*.

If one finds that a certain place is on the 8th or the 50th, or some other circle north of the equator, he knows how many miles it is north of that dividing line; for every degree is about 69 miles. San Francisco, for example, is close to the 38th parallel; Chicago is close to the 42d; and St. Paul is on the 45th (Figs. 125 and 160). Knowing this, it is easy to see that Chicago is 4°, or about 276 miles, farther north than San Francisco. It is also easy to see that St. Paul is 3°, or over 200 miles farther north than Chicago.

Thus, by the help of the parallel lines one can find how far any place is north or south of the equator. Instead, however, of saying that places are so many degrees *north or south of the equator*, we usually say that they are in so many degrees *north or south latitude*. San Francisco, for instance, is near 38° *north latitude* (abbreviated *N. Lat.*). Both ways are correct, but the latter is merely the shorter way of saying it. *Latitude is nothing more than distance north or south of the equator, measured in degrees;* and the parallel lines are called *parallels of latitude*.

Of course there are no marks *upon the earth* to show where these circles run. They are drawn *on maps*, where they are of great use because they help to locate places.

Small maps and globes cannot well show the entire ninety parallels on each side of the equator. That would make too many lines. For this reason, only every fifth or tenth parallel is usually put on such maps. Examine some maps (such as Figs. 9 and 125), to see which ones are given. Near what parallel do you live?

3. How places can be located in an east and west direction

As in the city, some means must also be found for locating places east and west; for two points might be in 10° north latitude and still be several thousand miles apart. Show that this is so.

Imaginary lines are used for this purpose, as before; but this time they extend around the earth from pole to pole (Fig. 288). These lines, extending through both poles, are called *meridians*.

In a city it makes little difference what north and south street is chosen from which to number the others. It is necessary only that a certain one be *agreed upon*. The same is true of these meridians. No one is especially important, as the equator is, and any one of them *might* be chosen from which to start. Indeed, different nations have selected different circles as the one from which to begin numbering. In France the meridian extending through Paris is chosen; in England that through Greenwich, near London; and in America the one passing through Washington is sometimes used.

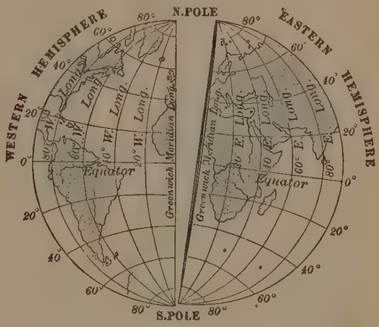

FIG. 288.—The earth, cut in halves along the Greenwich meridian, showing some of the meridians. The meridian 20° is usually considered the dividing line between the eastern and western hemispheres.

It is, however, important that all people agree on some one meridian to start from, so that all maps may be made alike. On that account, many countries begin their numbering with the meridian which passes through Greenwich. The maps in this book follow that plan.

It is necessary in locating places on the earth to study the movements of the sun and the stars; and this is done in a building, called an *observatory*, in which there are telescopes and other instruments. Since there is such an observatory at Greenwich, this seemed to the English people to be a fitting place from which to begin numbering the meridians.

Commencing with the meridian of Greenwich, we measure off degrees both east and west of it. On maps and globes these distances are represented by circles extending completely around the earth, through both poles. Thus there is a meridian 1° west, another 2°, a third 3°, etc. Going eastward, the meridians are numbered 1°, 2°, 3°, etc., in the same way. Any place on the 3d meridian *west* of Greenwich is 3° *west* of the principal meridian; if on the 60th meridian, it is 60° west.

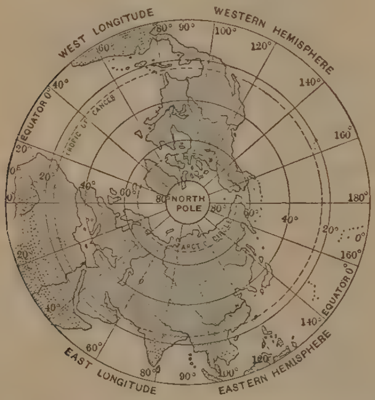

FIG. 289.—A view looking down on the north pole, to show how the meridians come to a point at the north pole. Notice that if the 0° meridian were continued, it would unite with the meridian 180°.

Again, however, instead of saying that a place is so many degrees *east or west of the principal meridian*, we say it is in so many degrees *east or west longitude*. This is merely the shorter way of saying it. The place on the third meridian, just mentioned, is, therefore, in 3° west longitude, and the other place is in 60° west longitude. *Longitude is nothing more than distance east or west of the principal meridian, measured in degrees.*[1] The circles that form the meridians are also known as *circles of longitude*.

Any place on the 20th meridian *east* of Greenwich is in 20° *east longitude* (*E. Long.*). New York is in 74° W. Long., while San Francisco is in about 123° W. Long. Which meridian passes near Chicago? Denver?

The distance around the earth from north to south, through both poles, is four times 90°, or 360° in all. The equator is likewise divided into 360 parts, or degrees. There are therefore 360 meridians, if they are drawn one degree apart. They are numbered up to 180° in both directions (Fig. 289). Thus, 180° E. Long. is the same as 180° W. Long.

The meridians are not parallel, like the circles of latitude. They are farthest apart at the equator, where the width of a degree of longitude is about 69 miles. But all the meridians come together at the poles, as you can see on a globe or on Figure 289. Therefore the width of a degree of longitude becomes smaller toward the poles.

Why and how degrees are divided into smaller parts

On maps showing only a small part of the earth, the circles of latitude and longitude are too far apart to be of much use. It is therefore necessary to have still other circles. For this purpose the degrees are divided into parts, called *minutes*. There are sixty minutes in a degree, as there are sixty minutes in an hour. The minutes themselves are also divided into sixty parts, called *seconds*.

The sign for a degree is °; for a minute ′; for a second ″. Thus, 60 degrees, 40 minutes, and 20 seconds north latitude is marked 60° 40′ 20″ N. Lat. Examine some map of a small section of country to find these signs.

Knowing the latitude and longitude of any place, it may, by the aid of a map, be as easily located as a house in a great city. For instance, Denver is about 40° N. Lat., and 105° W. Long. It is therefore far to the north and west of New Orleans, which is about 30° N. Lat., and 90° W. Long.

Find the latitude and longitude of some of the large cities on the map (Fig. 40). Notice also that only every fifth meridian is marked on this map. Compare this with the map of New England (Fig. 45). Since the latter map represents a smaller section, more meridians can be drawn upon it. Now look at the map of the Holy Land (Fig. 465), which represents a still smaller section. There both degrees and minutes are shown.

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[1] The ancients thought that the world extended farther in an east and west direction than in a north and south direction. Therefore they called the east and west, or *long* direction, longitude; the north and south direction, latitude.

2. Standard Time

The differences in time between places

If you were to travel from New York to San Francisco, you would find on arriving there that your watch was three hours too fast. The reason is that the rotation of the earth is from west to east. This causes the sun's rays to fall upon the Atlantic coast more than three hours earlier than upon the Pacific coast. Hence, when it is noon in New York, it is only about nine o'clock in the morning at San Francisco. The time steadily changes in going either east or west, so that no two places on an east-west line have exactly the same time by the sun.

The trouble caused by such differences

Formerly every city used its own sun time, or *local time*. This was a source of great trouble to travelers; for their watches were always wrong when they arrived at new places. When railroads were built, and people began to travel more, and to go longer distances, the many different kinds of local time became even a greater inconvenience.

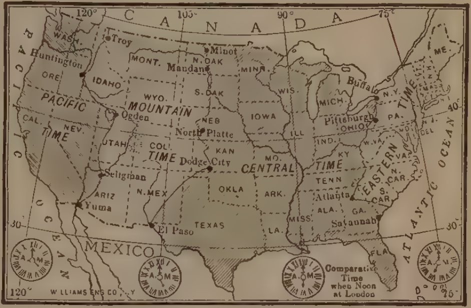
How this trouble is now largely avoided

In order to avoid this trouble, our continent has been divided into belts, in each of which the railways, and most of the towns, have agreed to use the same time. Since this time is the *standard for all*, these belts are called the *Standard Time Belts*. The one in the extreme East, including eastern Canada, is called the *Colonial Belt;* the belt next west of this, which includes New England, New York, and some of the other Eastern States, is called the *Eastern Time Belt*. What are the others called (Fig. 290)?

In traveling across the country from New York City to San Francisco, one starts with his watch set at the standard time for the Eastern Time Belt. After a while he comes to a place where the time is changed one full hour; then he sets his watch back an hour in order to have the Central Time. Going still farther west to the Mountain Belt, the watch is again set back one full hour. What is done when the Pacific Belt is reached? By this arrangement, the same time is used over a very broad belt, and only a few changes of the watch have to be made. State how a watch would have to be changed when one goes *eastward* from San Francisco to New York.

How the time for each time belt is fixed

Our study of longitude helps us to understand what determines the places for changing this time. The earth makes one complete rotation every 24 hours, so that the sun passes over 360 degrees in the course of the day of 24 hours. Dividing 360 by 24 gives 15; that is, the number of meridians, one degree apart, that the sun passes over in a single hour. Therefore, when it is noon in a place on the 75th meridian, as at Philadelphia (Fig. 290), it is eleven o'clock just 15° west of this, or on the 90th meridian. When it is noon at one point on a meridian, it is noon all along that meridian.



STANDARD TIME IN THE UNITED STATES

Fig. 290. — To show the Standard Time Belts of the United States.

This explains what has determined the boundary lines of the time belts. The time selected for the Eastern Belt is that of the 75th meridian; for the Central Belt, that of the 90th meridian, which is just one hour later. What meridian is selected for the Mountain Belt (Fig. 290)? For the Pacific Belt?

Each of these meridians runs through the *middle* of the belt whose time it fixes. Thus, the eastern boundary of the Central Time Belt is halfway between the 75th and 90th meridians, that is, 82½° W. Long.;

and the western boundary is halfway between the 90th and 105th meridians, or 97½° W. Long.

Why the boundaries for these time belts are not regular

As a matter of fact, the railways do not change their time *exactly* on these meridians. It often happens that the meridians chosen for boundaries pass through very unimportant points, or even cross the railways far out in the open country. Instead of following the exact boundaries, therefore, the railways often select well-known cities as the places where the changes shall be made. For instance, Buffalo, Pittsburgh, and Atlanta are the principal cities that lie on the boundary between the Eastern and the Central time belts. Railway time-tables show a change of one hour at these points; and passengers going east or west change their watches one hour here (Fig. 290). Name cities located on other boundaries. Thus it happens that the boundaries where the railways *actually* change their time are somewhat irregular. But that makes little difference, so long as there is a general agreement as to the location of the boundaries.

It is true that the Standard Time is incorrect for most places. It is the sun that really fixes our time, and at most points Standard Time cannot agree with the sun, or local time. Yet Standard Time relieves us of much trouble, and that is the chief reason for its use.

In order that our system may agree with that of other parts of the world, the time of the Greenwich meridian is taken as a basis. Thus the whole world may be divided into Standard Time belts, with a change of an hour at every fifteenth meridian.

Review Questions

1. Explain the need of some way of locating places exactly. 2. How may houses be located in large cities? 3. How can all places be located in a north and south direction on the earth? 4. How in an east and west direction? 5. Locate several places accurately by using a map. 6. Define latitude; longitude. 7. What is meant by a degree? 8. How many degrees of longitude are there on the equator? 9. How many miles is each of these degrees? 10. Why are meridians not parallel? 11. How many degrees of latitude are there from pole to pole? 12. How are degrees subdivided? Why? 13. Explain about the differences in time by the sun, in different places. 14. How have these differences caused much trouble? 15. How is the difficulty now largely avoided? 16. Explain how the time for each time belt is determined. 17. Name the time belts in North America, and locate each. 18. Why are the boundaries not regular?

Suggestions

1. Find how the streets of Washington have been numbered and lettered. 2. What is the latitude and longitude of Boston? Of Washington? Of Chicago? Of your home? 3. Find some cities that are on or near the 42d parallel of latitude. 4. What place is in 25° N. Lat. and 81° W. Long.? What place is near 40° N. Lat. and 75° W. Long.? 5. Find places that have nearly the same latitude as your home. 6. Show on a globe, or map, where a ship would be in the Atlantic when in zero latitude and zero longitude. 7. Examine a globe to see what meridian is a continuation of zero longitude on the other side of the earth. 8. Find the latitude of the Tropic of Cancer; of the Tropic of Capricorn; of the Arctic Circle; of the Antarctic Circle. 9. Where and how much would you change your watch in traveling from San Francisco to Chicago? 10. Examine some railway time-tables to see how they indicate the changes in time. 11. What is the difference, where you live, between Standard Time and solar or sun time? 12. Find out whether the true Standard Time is telegraphed to your city each day, and if so from what place.

III. WINDS AND RAIN

1. Winds

The problem before us

In our study of North America, we have learned that the winds of different sections came from different directions. For example, in the West Indies, Central America, and southern Mexico, the winds usually blow from the *northeast;* but on the western side of the continent, all the way from San Francisco to Alaska, the wind blows quite regularly from a *westerly quarter.* In the eastern part of the United States, on the other hand, the winds are irregular in direction, although they blow more often from the west than from any other quarter. We will now study the causes for these differences, and also learn what the principal winds on the earth are.

The currents of air caused by a hot stove

It will help us to understand this subject if we first find what currents of air a hot stove causes in a room (Fig. 291). The first thing that happens when a fire is kindled is that the air near the stove is warmed. This causes it to expand and become lighter. Then the cooler, heavier air in other parts of the room settles down and flows in toward the stove, forcing upward the warm, light air near the stove. This warm, rising air grows cooler as it comes in contact with the cool ceiling and the walls of the room. This makes it dense and heavy again; it then settles toward the floor at some distance from the stove, and once more moves toward the stove.

In other words, the currents of air keep circling around in the room, rising when warmed, and settling when cooled. In such a room, you can easily observe how warm the air is near the ceiling, where it has risen above the stove; and how much cooler it is near the floor at some distance from the stove.

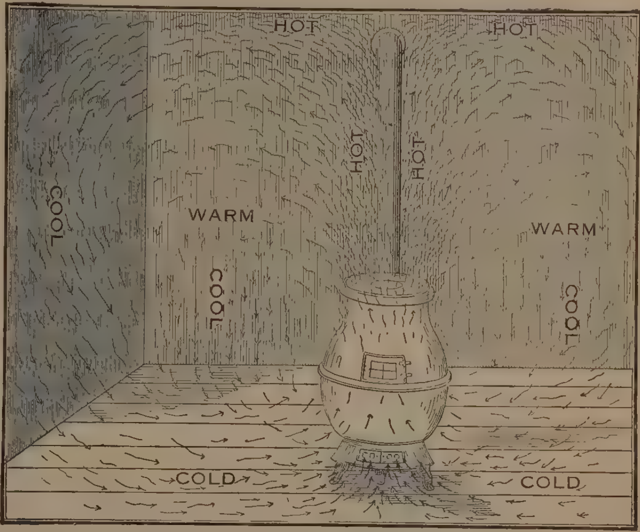


Fig. 291. — The arrows show the currents of air in a room that are caused by a hot stove.

The greater winds of the earth may be compared to this movement of air in a room.

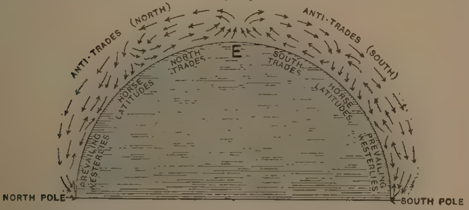


Fig. 292. — Diagram to show, by arrows, the movement of the greater winds of the earth.

Here, however, the broad torrid zone, which is warmed by the sun's rays, takes the place of the stove. In the torrid zone the hot sun heats the air, thus causing it to expand and become lighter, just as the air does about the hot stove. The cooler, heavier air to the north and south of the torrid zone then flows in and pushes the light air up and away. Such a flowing of the air is what we call *wind*.

How the principal winds of the earth resemble these currents

This vast movement of the air is illustrated in Figure 292. The letter *E* stands for the equator. The arrows represent the cooler air, north and south of the equator, as crowding in toward that section, then rising, and returning once more to the north and south.

The air that flows toward the torrid zone causes very regular winds that are called *trade winds*. They start in both the north and south temperate zones, hundreds of miles away, and blow toward the equator day after day and month after month.

Names of the principal winds on the earth

Since the heated air must escape somewhere, it rises far above the surface of the earth, and then flows back in the same direction from which it came. This forms the *return trade*, or *anti-trade winds* (Fig.

292). The atmosphere extends many miles above the earth, so that there is plenty of room for two winds, one above the other, blowing in opposite directions.

In Cuba, the Caribbean Sea, and elsewhere, where the trade winds are felt at the surface, one notices that the clouds, far up in the sky, move steadily in the opposite direction. They are being borne along in the anti-trades. When volcanoes in Central America have been in eruption, the ashes that were hurled out from them have been carried hundreds of miles in the opposite direction from that of the trade winds at the surface.

Being cooled on account of its great height, the air of the anti-trades slowly settles, some of it coming to the surface at about a third of the distance to the poles. There it spreads out, a part continuing on toward the poles, a part returning to the equator as the trade winds. Point out the arrows that show these movements in Figure 292.

Thus, as you see, these currents in the atmosphere closely resemble those in the room. In both cases air moves (1) *in* toward a heated place, (2) then *up*, then (3) *outward* and *down*, and once more (4) *inward* toward the heated part. Make a drawing to illustrate these *four* directions of movement of the air.

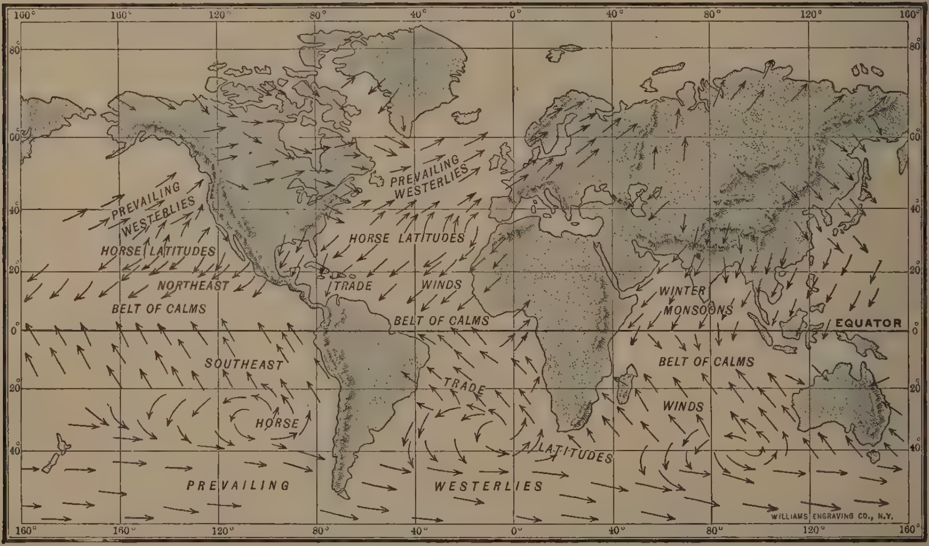


FIG. 293. — A diagram to show the principal wind belts of the earth.

There are differences, however, and one of them is especially important. In the room, the currents move *directly* toward the stove; then, after rising, moves directly away from it. If the earth stood still, the trade winds also would blow directly toward the equator from the north and south; and the anti-trades would blow directly away from it.

Effects of earth's rotation on direction of these winds

As you know, however, the earth rotates from west to east at a rapid rate. This rotation causes the trade winds to be turned from their straight course toward the equator. Those in the northern hemisphere are turned to the *right*, so that they blow from the *northeast* instead of from the north. Those in the southern hemisphere are turned toward the *left*, and therefore they blow from the *southeast* instead of from the south.

The anti-trades are also turned toward the right in the northern hemisphere, where they blow from the southwest, and toward the left in the southern hemisphere, where they blow from the northwest. The exact reason for this effect of rotation is far too complex to state here; so that only the facts are given without explanation.

The great wind belts

It is now easy to see why the West Indies, Central America, and southern Mexico receive such regular winds from the northeast. They lie in the belt of the northeast trade winds just described.

The prevailing west winds of the Pacific coast are a part of the air of the anti-trades that has settled to the surface and is moving on toward the east. If you watch the higher clouds, you will find, in most parts of the United States, that they are moving toward he east. Even at the surface, the winds low from the west more often than from ny other quarter. In the northern part f the United States and in Canada, the vinds blow so often from the west, northvest, or southwest, that this whole region s known as the region of the *prevailing vesterlies.*

Regular winds, such as are found in Iorth America, are likewise found in most ther parts of the world. In other words, here are several belts of regular winds xtending around the earth. Figure 293 hows these clearly. Point out the belt of *rade winds* north of the equator. Point ut the *prevailing westerlies.* Point out the wo similar wind belts on the south side of he equator.

hy the inds are ost regular er the ocean

Notice how much more distinctly these elts are shown over the ocean than over the land. There are several reasons why winds blow much more steadily over the ocean than over the land. The prinpal one is that the temperature of the ater does not change so quickly as that the land. On the land one place may ecome much warmer than another not far vay, and then winds blow toward the armer section. This often changes the rection of the regular winds on the land.

The belt of calms; and the belts of light and variable winds

Besides the four belts of winds just mentioned, there are three other belts in which it is either calm, or else there are only light, variable winds. The most important of these is called the *belt of calms* (Figs. 292 and 293), which is several hundred miles in width. This belt is situated where the trade winds from the northeast and those from the southeast die out. It is in this belt that the heated air in the torrid zone is rising. Since it is moving *upward*, no wind can be felt, and this is, therefore, a belt of prevailing calms. What winds there are, are usually light and changeable.

Northern Mexico and southern California are situated in another belt of light winds with frequent calms. This is the belt where the air of the anti-trades is *settling* toward the earth; and settling air, like rising air, does not cause winds. This region is known as the *horse latitudes.*[1] Point out the belt on Figures 292 and 293.

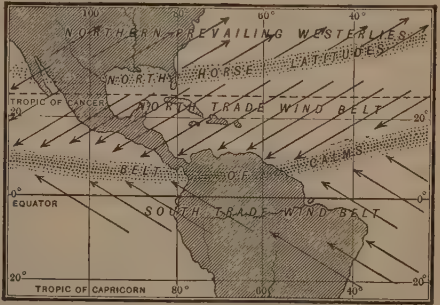


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FIG. 294.—Diagram to show the position of the trade winds belts and the belt of calms in summer.

That the winds blow very steadily over the ocean most clearly shown (Fig. 293) in the southern misphere, where there is little land. There, in e belt of prevailing westerlies, the wind is almost the time from the west. Indeed, it is said that vessels, choosing a course south of Africa and South America, can sail around the world with fair winds almost all the way, if they go *toward* the east; but if they sail in the opposite direction, the winds are against them.

[1] Called horse latitudes because sailing vessels, carrying horses from New England to the West Indies in the early days, were so delayed by the calms that the horses had to be thrown overboard when the drinking water gave out.

Show the corresponding belt on the south side of the equator.

Effects of earth's revolution on all these belts

The belt of most intense heat is not always in exactly the same part of the earth. In June, when the sun is vertical at the Tropic of Cancer, the belt of greatest heat lies north of the equator; and in December, when the sun's rays are vertical at the Tropic of Capricorn, it lies farther south. As the belt of greatest heat thus shifts with the season, the belt of calms moves also. That causes the trade wind belts to move, likewise. Indeed, all the belts slowly shift northward in summer and southward in winter (Figs. 294 and 295).

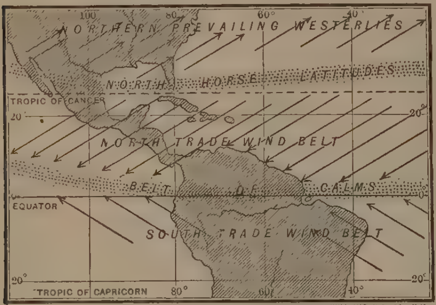

FIG. 295. — Diagram to show the position of the belt of calms and the trade winds in winter.

2. Rain

Relation of winds to rain

Knowing the wind belts that encircle the earth, we have a key to the principal rain belts; for the winds are the water carriers of the earth. Water that is evaporated from the surface of the oceans and of the lands, is borne along in the air in the form of vapor. It descends to the earth as rain or snow, falling in great abundance in some places, and scarcely at all in others.

Principal cause of rain

To understand the cause for the change of vapor to rain or snow, it is necessary, first of all, to know that there can be more water vapor in warm than in cool air. Quite warm air can hold much more vapor than cold air.

For this reason, whenever air is cooled sufficiently, some of the water vapor which it bears is condensed. For example, vapor condenses on a cold glass because the air next to it is cooled; and dew forms on grass when the air near the ground grows cool in the evening. In a like manner, the vapor in our breath is condensed, thus forming a little cloud, when we breathe into the cold air of a winter day. Rain is also caused by the cooling of air which contains vapor.

One important cause for the cooling of air is that it expands on rising above the surface. Perhaps you have noticed how cool the air feels as it rushes out from a bicycle tire when you open the valve. The coolness is due to the expansion of the air as it comes out. In a similar way, when air rises above the surface of the earth, it expands, because there is less air above to press upon it. Then it grows cool; and while doing so, some of its vapor may be condensed to form clouds and raindrops.

This is the chief reason why winds from the ocean cause rainfall on mountain slopes and plateaus. The air is forced to rise in order to pass over the highlands, and that allows it to expand and grow cool. For the same reason, air that rises in the warm parts of the earth, like the belt of calms, also gives up vapor to form rain. Briefly, — *when air rises, it expands and cools; and then rain usually follows.*

One reason for dry weather

On the other hand, air that is settling grows warmer; and, instead of giving up its vapor, it becomes dry and clear. This may again be illustrated by the bicycle; for when air is pumped into the tire, the pump becomes warm as the air is made denser, or is compressed, by pumping. In a like manner, air that is descending toward the earth's surface is compressed and warmed because of the great pressure of the atmosphere above. Since there can be more vapor in warm than in cool air, such settling air currents become steadily drier. They cause clouds to disappear, and water to be evaporated from the ground. This is the reason why the horse latitudes are arid belts; for, as you remember, the air in these belts is settling from above. Briefly,—*when air descends, it becomes denser and grows warmer; then the sky is clear and the weather dry.*

The regular ain belts

l. In North America

These facts have been well illustrated in the rains of North America. The northeast trade winds, having gathered a large amount of vapor from the ocean, deposit it on the windward slopes of the West Indies, outhern Mexico, and Central America Fig. 296). The southwestern slopes of the Vest Indies, however, receive a much maller quantity of rain; and the western oast of Mexico is quite arid.

Farther north the prevailing westerlies, aving traveled a long distance over the Pacific Ocean, likewise cause heavy rains long the western coast of North America Fig. 297). But these winds also lose uch of their moisture in passing over the Vestern highlands; and the land farther ast, therefore, reeives very little ain.

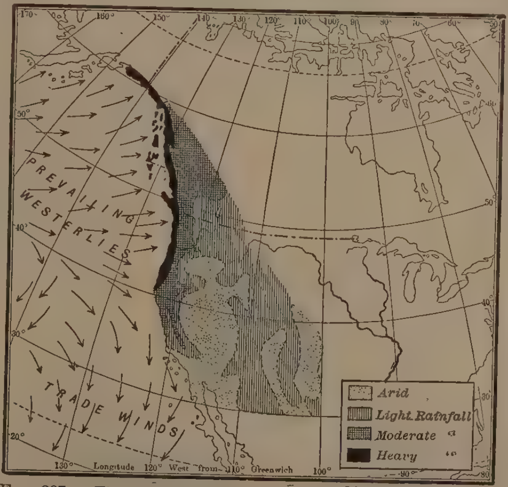

FIG. 297.—The heavy rainfall where the prevailing westerlies blow over the rising coast. What is the condition farther east? What is the case where the trade winds blow? Why?

Northern Mexico ud the southwestrn part of the nited States, lying ithin the horse titudes, where the r is descending, so receive very ttle rain and are id (Fig. 297). his is true even the seashore southern Calirnia.

In other ions north he equator

Other regions lyg within the regur wind belts show e same conditions of rainfall. For example, note what heavy rains the northeast trade winds bring to northern uth America (Fig. 296), to southeastern Asia (Fig. 299), and to the islands near by, such as the Philippine Islands.

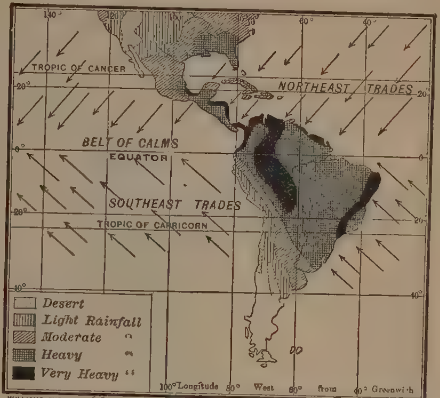

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FIG. 296.—The rainy east coasts and arid west coasts of the trade wind belts. Also the rainy belt of calms of South America.

In western Asia and northern Africa, on the other hand, these winds deposit little moisture, as is clearly shown by Figures 298 and 299. One cause for this is that, before reaching these regions, the trade winds have been blowing a long distance over the land, and not over the oceans. For this reason they have little vapor to deposit. Another very important reason is that the air is moving from a cooler to a warmer region, and is steadily becoming warmer. Instead of being forced, therefore, to give up its moisture, it takes *more* vapor. Thus in this region the trade winds take up water wherever they find it; and instead of causing rain they are really *drying winds.* This accounts for the Sahara and some other deserts.

The *prevailing westerlies* reach Europe, as well as North America, and cause abundant rainfall on the western coast. Since there are no lofty mountains on the west coast of Europe, however, there is no arid and desert land in this part of the west wind belt. On the other hand, the three peninsulas of southern Europe, like southern California, lie partly within the horse latitudes; and for this reason there is little rain, especially in their southern portion.

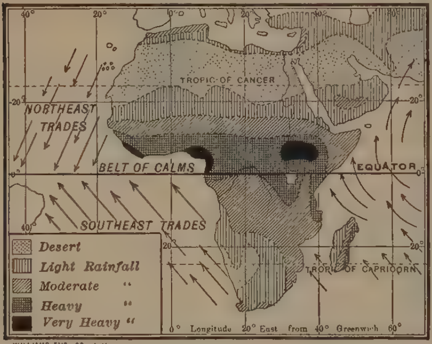

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FIG. 298.—To illustrate the desert regions in the trade wind and horse latitude belts of Africa. Also to show the heavy rainfall in the belt of calms. Find the similar belts on Figures 296, 299, and 300.

3. In regions south of the equator

South of the equator the southeast trade winds cause heavy rains on the east coast of South America (Fig. 296); then, crossing the continent, they give up more vapor in ascending the eastern slopes of the Andes. The air is so drained of its vapor here, that when it descends on the western side of the mountains, there is little left. For this reason the southern parts of Peru and northern Chile, even within sight of the Pacific Ocean, form one of the most desert regions of the earth. Southern Chile, on the other hand, being in the belt of the prevailing westerlies, has plenty of rain (Fig. 299).

Most of Australia is in the southeast trade wind belt. Therefore, rainfall is ample on the eastern coast; but since the highlands on this continent are close to the east coast, nearly all the remainder of the country suffers for want of rain (Fig. 300). The southwestern tip of Australia, the island of Tasmania, and the southern island of New Zealand, like southern Chile, are reached by the prevailing westerlies; and for that reason they receive abundant rain.

4. In the belt of calms

The belt of calms is the most rainy of all the belts (Figs. 296, 298, and 300), because its hot, moisture-laden air is rising and cooling. After a clear night in that region, the sun usually rises in a cloudless sky. As the morning advances, and the heat grows more intense, the damp air rises more rapidly; then small clouds appear, and they grow steadily until rain falls from them. Showers occur almost every day, increasing in the afternoon. When the sun sets, and less air rises, the clouds melt away, the stars appear, and the night is as clear as before. Our hot, muggy summer days, with heavy thunder showers in the afternoon and evening, illustrate the weather that is repeated, day after day, in this belt of calms.

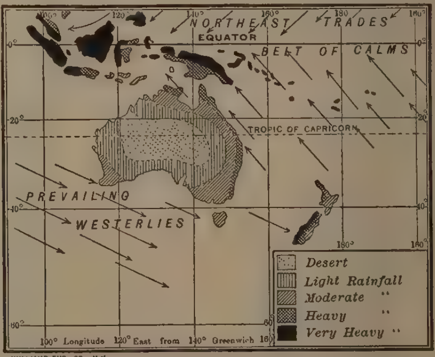

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FIG. 300.—Showing the heavy rainfall on the east-facing coast of Australia where the trade winds blow. Notice also the arid interior and west coast. What is the condition in the belt of calms? What resemblance do you see to Figure 297?

You have already learned (p. 210) that the wind belts shift northward in summer and southward in

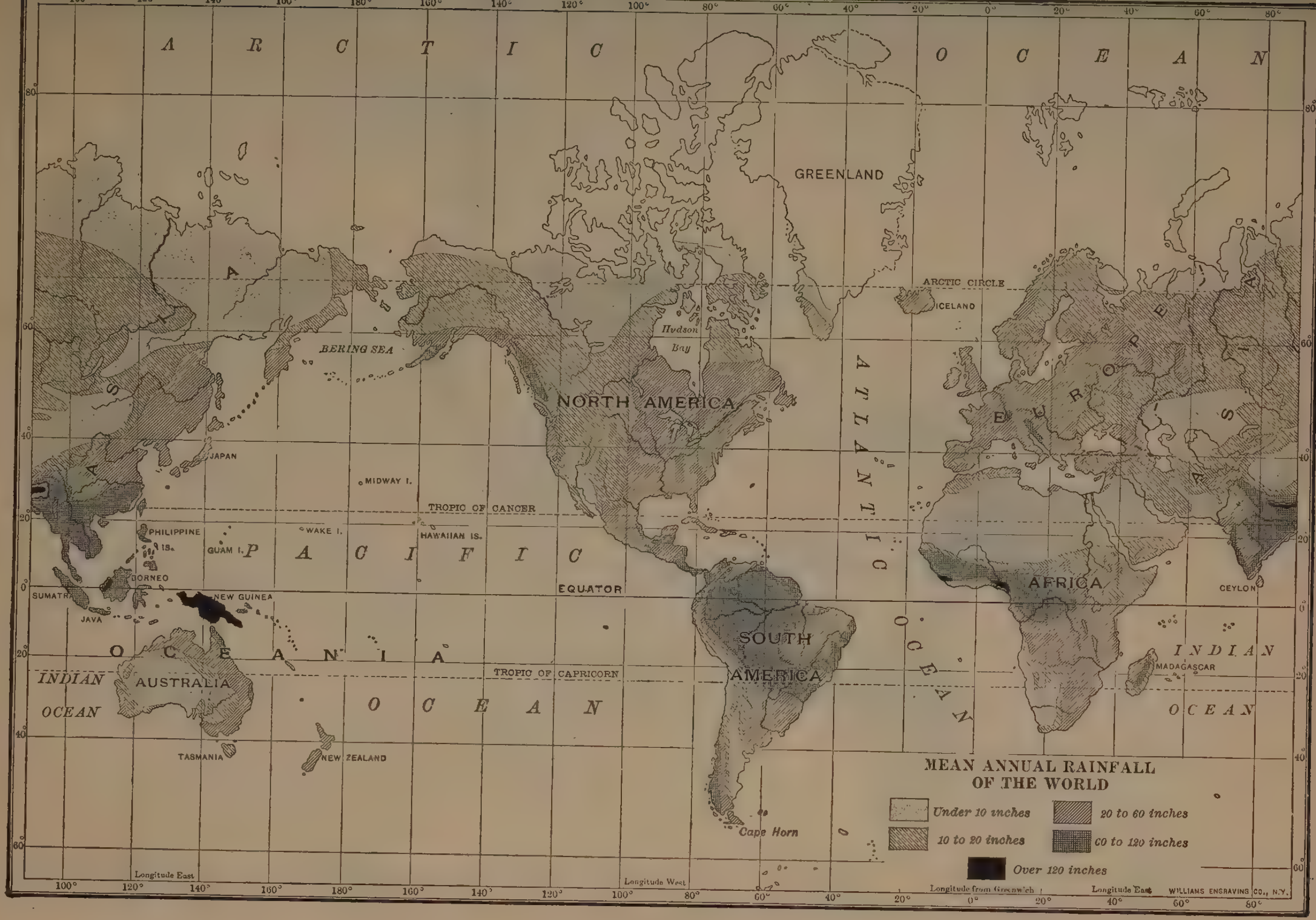
MEAN ANNUAL RAINFALL
OF THE WORLD
Under 10 inches
10 to 20 inches
20 to 60 inches
60 to 120 inches
Over 120 inches
ARCTIC OCEAN
GREENLAND
ICELAND
ARCTIC CIRCLE
Hudson Bay
NORTH AMERICA
SOUTH AMERICA
Cape Horn
ATLANTIC OCEAN
EUROPE
ASIA
AFRICA
CEYLON
MADAGASCAR
INDIAN OCEAN
BERING SEA
JAPAN
MIDWAY I.
WAKE I.
GUAM I.
HAWAIIAN IS.
PHILIPPINE IS.
BORNEO
SUMATRA
JAVA
NEW GUINEA
OCEANIA
AUSTRALIA
TASMANIA
NEW ZEALAND
PACIFIC OCEAN
TROPIC OF CANCER
EQUATOR
TROPIC OF CAPRICORN
Longitude East
Longitude West
Longitude from Greenwich
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FIG. 299.

5. The shifting of these rain belts

winter. Many places in the torrid zone are within the belt of calms during the summer months, and are swept by the trade winds in the winter months. This is of special importance, because the rain belts shift with the wind belts. That divides the year in such places into two seasons: (1) a wet season, when the region is in the belt of calms; and (2) a dry season, when the trade winds blow.

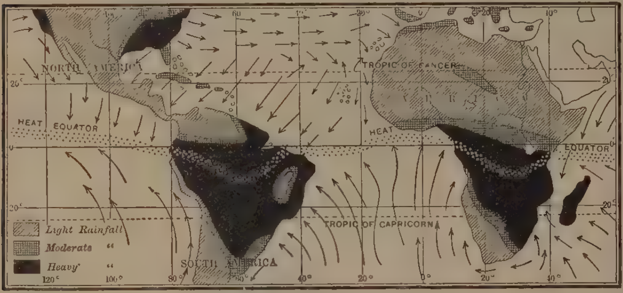

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FIG. 301.— Winds and rainfall in South America and Africa from December to February.

The part of northern Africa that lies just south of the Sahara Desert affords an instance of this (Figs. 301 and 302). Find another instance in northern South America. Note what an enormous area in each of these continents is wet during one part of the year and dry during the other.

Regions of irregular rains

1. In eastern United States and Canada

(1) *Kind of weather here*

Thus far only the *regular* wind and rain belts have been considered. From what has been said, one might expect that the west winds, so dry after passing over the highlands of western United States, would continue eastward and cause our Central and Eastern States to be arid. As a matter of fact, we know that abundant rain falls in this section, as shown by Figure 303. We know, too, that there are no very regular winds over this entire area; on the contrary, both winds and temperature are quite changeable. In any particular locality it may be warm and pleasant, with a south wind on one day; the next day a cool, dry wind may blow from the northwest; after two or three days this may give place to a cloudy sky and rain, brought on by south or east winds; and then fair, cool weather, with northwest winds, may again set in.

(2) *The reason for such weather*

The reason for such changeable weather here is that this region is crossed by great storms, moving from west to east. When such storms begin in the Northwest, there is a large area there with lighter air than that over the surrounding region. Such an area is called a *low pressure area* (Fig. 304). The heavier air, from the surrounding country, flows toward this low pressure area. This causes winds which on the south side blow from the south, on the east side from the east, and so forth (Fig. 304).

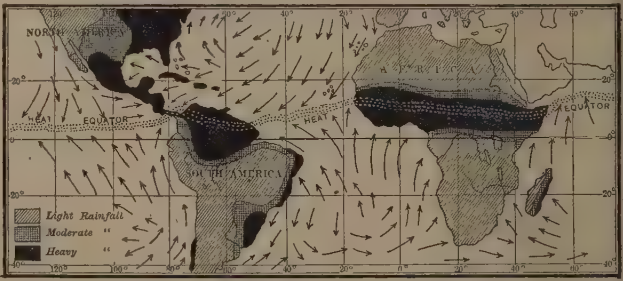


FIG. 302.—Winds and rainfall in South America and Africa from June to August. Compare with Figure 301 to see how the belts of heavy rain have migrated as the wind belts have shifted with the change of season.

The air that flows in from all sides rises near the center of the low pressure area. As it rises, the vapor condenses, forming clouds and rain, as in the belt of calms. Such an area of low pressure, with its clouds and rain, is known as a *cyclonic storm area* (Fig. 305).

Instead of remaining in one place, the cyclonic storms travel steadily onward, usually beginning in the northwest, and

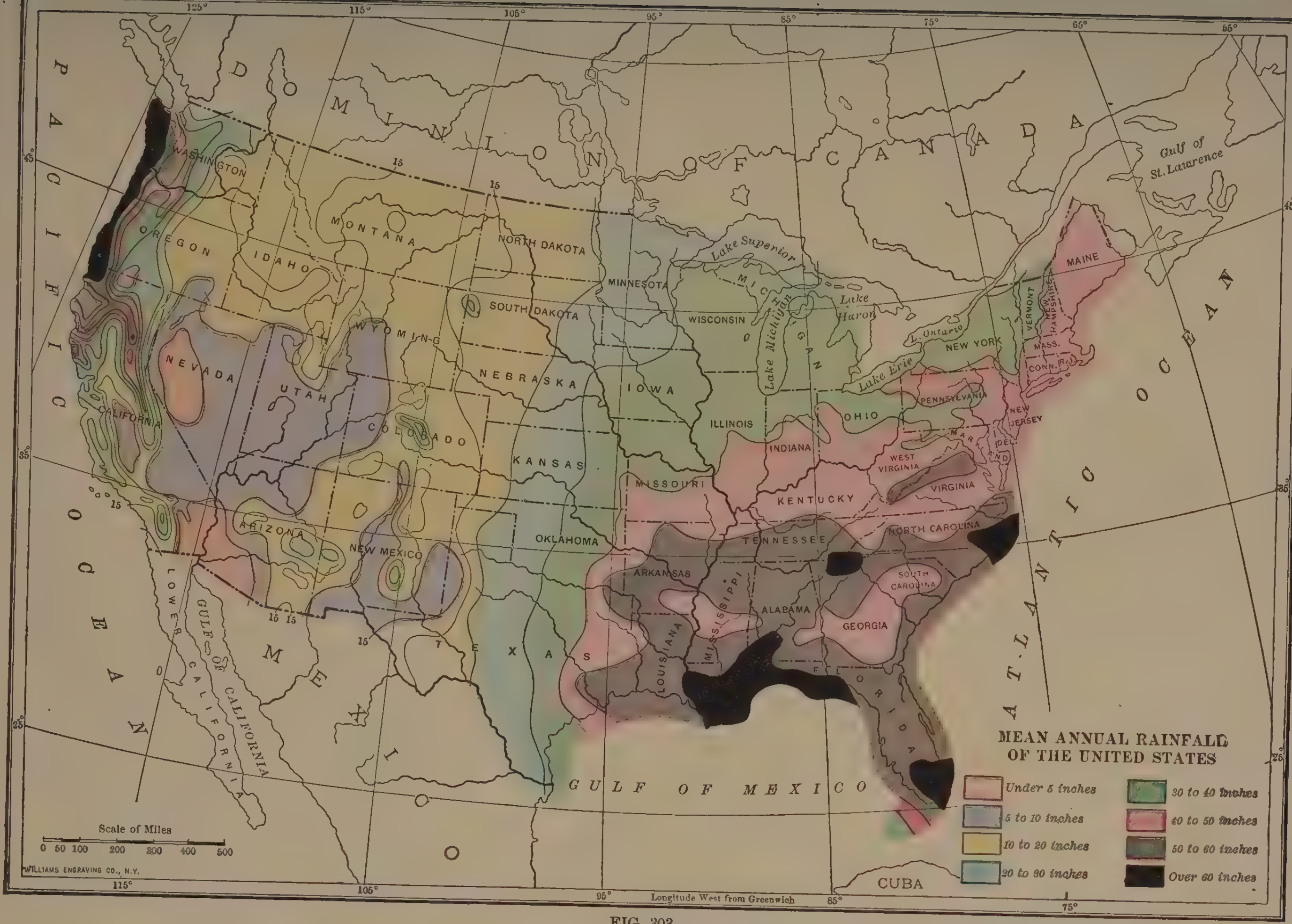

MEAN ANNUAL RAINFALL OF THE UNITED STATES

FIG. 303.

always passing eastward (Fig. 306). The paths followed by the storm centers generally pass over the Great Lakes, and down the St. Lawrence Valley to the ocean. They move eastward because the prevailing westerlies carry them along; indeed, these great cyclonic storms appear to be whirls, or *eddies*, in the prevailing westerlies, somewhat like the eddies in the current of a stream.

(3) *The movement of the cyclonic storms, and their extent*

These storms bring most of the rain that falls in the United States and Canada, east of the Rocky Mountains. The area of country upon which the rain may be falling from the clouds of one of the cyclonic storms is sometimes very great. Indeed, places fully a thousand miles apart sometimes receive rain at the same time, from the same storm (Fig. 305). As the storm moves eastward, the weather begins to clear on the western side (Figs. 304 and 306).

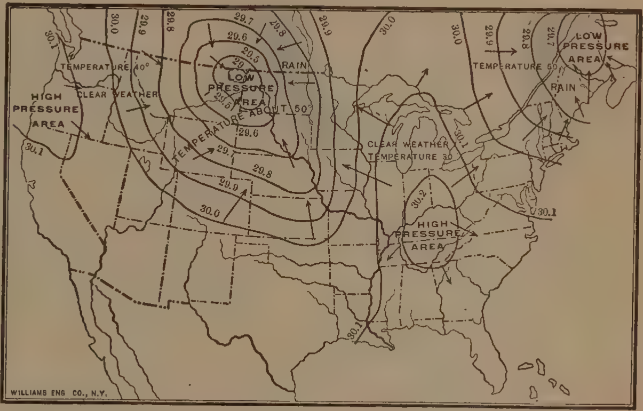


FIG. 304. — A weather map of the United States on a winter's day. The lines are lines of equal air pressure, — the lower the figure, the lighter the air (29.5 representing lighter air than 29.7). The pressure is determined by an instrument called the barometer.

The vapor that causes the rain in these storms is brought from the Gulf of Mexico and the Atlantic Ocean, being carried by the winds for hundreds of miles, even into Canada.

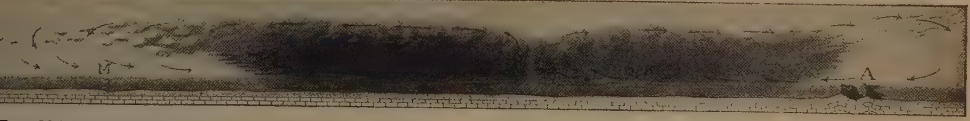


FIG. 305. — A diagram section through a cyclonic storm area. The arrows show the direction of the winds; the shaded area represents cloud and rain. Such a storm covers a very large area, often from the Mississippi River (M) to the Appalachian Mountains (A).

Not only are rains caused by these storms, but hot spells, and other changes as well. Warm winds, blowing from the south toward the low pressure areas, are the cause of the winter thaws and the summer hot spells, which are common in the Eastern and Central States. It is during the hot pells that thunder storms come; also, in some places, *tornadoes*, often called *cyclones*, in which the winds blow so fiercely that houses are torn to pieces (Fig. 307).

4) *Their differ- nt effects on the veather*

After a low pressure area has passed eastward, and the storm is over, the wind generally blows from the west. This causes cool, dry weather in summer, and cold snaps in winter. The latter are often so severe that they are called *cold waves;* and these, sweeping over the East, and even in the South, often do great damage to fruit trees and delicate plants.

While the cyclonic storms are quite irregular, they are almost certain to come whenever a wide area of low air pressure appears in the West. Thus, by watching the pressure of the air, as shown by instruments called *barometers*, it is possible to predict such a storm; and since they always move toward the east, it is possible, by further study of the barometer, and of

(5) *Possibility of predicting these storms*

the winds, to predict their course somewhat accurately, and thus warn people of their coming.

(6) *How the predictions are made, and how people are warned*

This work is so important that the United States government employs a large force of men, stationed in different parts of the country, to observe the pressure of air, direction of wind, etc. The observations are made at the same time at all stations, and telegraphed to the central office at Washington. A special branch of the government, called the *Weather Bureau*, has been established to have charge of this work.

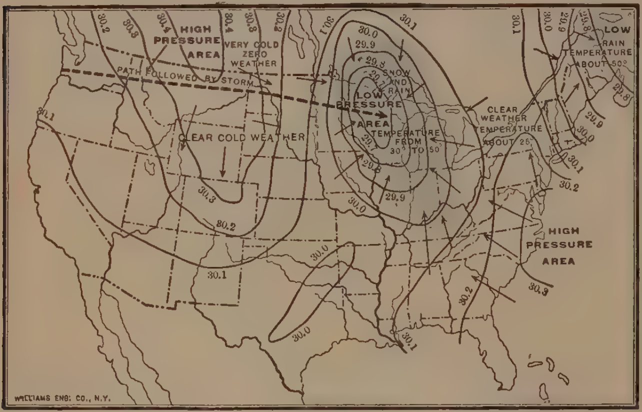


FIG. 306. — Weather map for the day following that of Figure 304. Study this carefully, and tell how it differs from Figure 304.

The storm predictions are telegraphed from Washington to all parts of the country, so that one knows what kind of weather to expect a full day before it comes. These predictions are usually printed in the newspapers, as you no doubt know.

Maps, called *weather maps*, are also sent out in great numbers. Figures 304 and 306 are made from such maps. Figure 304 shows a cyclonic storm in the Northwest, the arrows indicating how the winds blow, from all sides, toward the center of low pressure. Farther east is a region of high pressure. In Figure 306, the high and low pressure areas are again represented; but, since it is a day later, they have both moved eastward; and the following day they would be still farther east.

From these maps you can see how the direction of the wind, for any one locality, changes as the low pressure areas pass over the country. By them, also, any person may see what the weather promises to be in all parts of the country, and may follow the changes from day to day.

(7) *Value of such warnings*

By the predictions of the Weather Bureau, farmers and gardeners are warned against damaging frosts, and sailors against severe storms. Hundreds of thousands of dollars are saved in this manner every year. Especially valuable service has been rendered by the Weather Bureau in predicting the fierce *hurricanes* that start in the West Indies and sometimes do great damage there, as well as on our own coast (Fig. 308). These resemble the cyclonic storms, but are much more destructive. They often pass along our eastern coast, and then eastward out into the Atlantic.

Since the storms and high pressure areas have so great an influence on our weather, you will find it of interest to study the weather yourself. Watch the changes in wind, temperature, clouds, and rain; and if there is a barometer at hand, observe how it changes as the high and low pressure areas come and go. You might also examine the weather map and watch the weather that follows, to see how accurately the map predicts the weather.

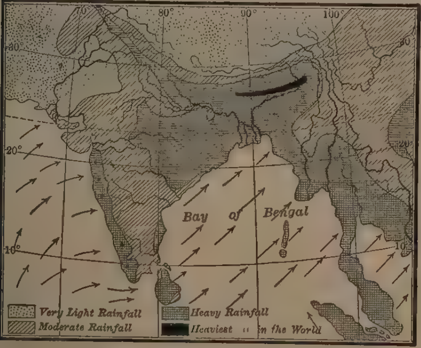
FIG. 307. — A house, one side of which was blown off during the passage of a cyclone.

Since Europe, like the United States, is mainly in the belt of prevailing westerlies, it also is visited by cyclonic storms. Many of the storms that cross our country pass over the ocean, and travel far into Eurasia before they die out. There, as here, the area pon which rain may be alling during one of hese storms is someimes very great. As n our country, the veather is made changeble by these storms; t may be warm and leasant one day, stormy he next, then clear and ool, or cold.

3. Regions of rregular rains n Europe

Similar cyclonic storms evelop in the prevailing westerly belt of the southern hemisphere; and here, too, they cause changes temperature, wind, and in. For this reason the weather of southern outh America, Australia, and the islands of the outhern Ocean resembles our own.

. Such regions . the southern emisphere



309.—The winds and rainfall during the summer monsoon of India.

There are other causes besides cyclonic storms for interference with the regular winds of the earth, and therefore with the rainfall. One of these is the difence in temperature between land and water.

ins caused other winds

Land warms and cools much more quickly than ter. For this reason the land along the seashore soon becomes warm on a hot summer morning, while the water near by remains cool. The air over the warm land is heated, as over a stove, so that it expands and grows light; but that over the water remains cool, like the sea itself.

1. Sea and lake breezes

FIG. 308.—A scene in Galveston, showing the vast destruction done by a hurricane in 1900, when many of the houses were torn to pieces during the storm.

This cooler air, being the heavier, then pushes in toward the shore; and thus a breeze from the sea, or a *sea breeze*, is created. In summer such a breeze is frequently felt at the seashore and along the shores of large lakes; and it often changes a very hot day into a cool one. Often, also, it brings a shower of rain, especially in the warm lands of the torrid zone. At night the land cools more rapidly than the sea; and the cool air from the land blows out toward the sea, forming a *land breeze*. Then the weather is clear.

The sea breezes blow only for short distances. But when a large body of land, like a continent, becomes warm, air from the cooler ocean may blow toward it for hundreds of miles. In winter, on the other hand, when the land becomes cooler than the ocean, the cold air over a vast area may move toward the sea. Such winds exist in Mexico and our Gulf States; but they are far more important in Asia.

2. The monsoons of India

The interior of that vast continent is so far from the ocean, that there are naturally great changes in temperature from summer to winter. During the winter, the heavy air over the cold land settles down as drying air, and presses outward beneath the warmer air which lies over the ocean. This produces dry winds from the land (Fig. 310). In summer, on the other hand, the air over the cool water crowds in, raises the heated air of the continent, and produces ocean winds and rain (Fig. 309).

Winds which thus blow in opposite directions in different seasons, are better developed in India than in any other part of the earth; and it was here that they received the name, *monsoon winds.* The name *monsoon* is now given to this class of winds wherever they may blow.

The rainy season comes in India when the summer monsoons blow (Fig. 309); and the rainfall is especially heavy where the moisture-laden air ascends the steep slope of the Himalayas. Indeed, the region north of the Bay of Bengal receives the heaviest rainfall of any part of the earth (Fig. 309). Here, in the month of July alone, there is three times as much rain as falls in the eastern part of the United States during the entire year. The winter monsoon, on the other hand, is so dry that vegetation withers and the soil becomes parched and cracked, as in a desert.

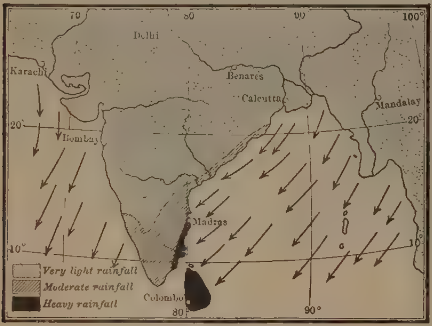


FIG. 310. — Map of the winter monsoon winds and rainfall of India. Compare with Figure 309, and notice how very light the rainfall is in one season, and how heavy it is in the opposite season.

Review Questions

1. Explain the currents of air that are caused by a hot stove in a room. 2. Show how the principal winds of the earth resemble these currents. 3. Name the principal winds of the earth. 4. What is the effect of the earth's rotation on the direction of these winds? 5. Locate the principal wind belts on the earth's surface. 6. Why are the winds most regular over the ocean? 7. Locate the belt of calms; and the two belts of light and variable winds. 8. What is the effect of the earth's revolution on the location of these wind belts? 9. What is the relation of winds to rain? 10. Explain the principal cause of rain. 11. Give one reason for clear, dry weather. 12. Locate the regular rain belts in North America. 13. In other regions north of the equator. 14. In regions south of the equator. 15. In the belt of calms. 16. Explain about the shifting of these rain belts. 17. Describe the more irregular weather in our Eastern States and in eastern Canada. 18. Explain the reasons for such weather. 19. In what direction do the cyclonic storms move, and what is their extent? 20. How do cyclonic storms affect our weather? 21. What about the possibility of predicting these storms? 22. How is that work managed? 23. How are the warnings of value? 24. What about regions of irregular rains in Europe? 25. In the southern hemisphere? 26. Explain the causes of sea breezes and land breezes. 27. Account for the different directions of the wind in southern Asia in summer and winter. 28. What effect have the summer monsoons of India on rainfall? The winter monsoons?

Suggestions

1. Estimate the number of barrels of water that falls on an acre of ground, or upon a city block, in one year, where the rainfall is forty inches. 2. How is a movement of air secured in your schoolroom in order to ventilate it? 3. Make a drawing to show the direction of the regular winds of the earth. 4. Watch the higher clouds to see in what direction they are moving. 5. Read once more the section on "Air" in the First Book, p. 54. 6. Write an account of the changes in weather for five days in succession: the wind direction and force; the clouds; rain; temperature; and, if possible, the air pressure. 7. Read the chapter on winds and storms in Tarr's "New Physical Geography," pp. 255–274.

IV. OCEAN MOVEMENTS, AND THEIR EFFECTS; ALSO DISTRIBUTION OF TEMPERATURE

1. Ocean Movements, and their Effects

Like the air, the ocean water is in motion. Its three principal movements are wind waves, tides, and ocean currents. The movements of the water, like those of the winds, are of the greatest importance to us.

(1) *Wind Waves and Tides*

Wind waves

Waves are formed by winds which blow over the surface of the water and ruffle it. Sometimes, during storms, the heavy winds pile up the water in waves that are from twenty to forty feet high. Even such great waves are rarely very dangerous to large vessels in the open ocean; but upon the seashore they do great damage to vessels, and even to the coast itself. The constant beating of the waves is slowly wearing the rocks away and dragging the fragments out to sea, thus cutting the coast back.

Tides

1. What the tides are

People living upon the seacoast know that the ocean water rises for about six hours, and then slowly falls for the same period. This rising and falling of the water, twice each day, forms what is known as the tides.

2. The cause of tides

For a long time men were puzzled to explain this movement of the ocean. It was called the breathing of the earth; and to this day, certain uncivilized races think that the tide is caused by some great animal.

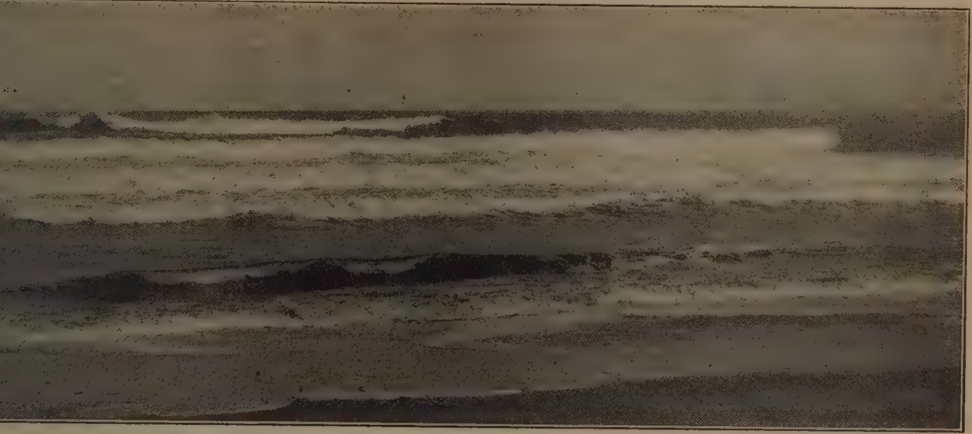


FIG. 311. — The ocean waves running on to the beach in great breakers.

As a result of much careful study, it has been earned that the tides are caused by the moon and he sun, especially the former. Each of these bodies s pulling upon the earth, by the attraction of gravi-ation, much as a horseshoe magnet pulls upon a iece of iron. Since the ocean is a liquid, this "pull" raws it slightly out of shape. This causes two reat swells, or waves, many hundreds of miles broad, ne on each side of the earth. They sweep across he oceans, following the moon, and, on reaching the oast, cause the rise of water known as the tide.

. Height of the dal wave

The tidal wave is only two or three feet igh upon islands in the open ocean; but it rises a great deal higher in many bays because the space hat it occupies becomes narrower near the ead of the bay. In some places, as in the Bay of Fundy, the tide reaches a height of forty or fifty feet.

The height of the tide also varies from day to day; for the moon and sun, which combine to form it, do not always work together. At new moon, and at full moon, — when the earth, moon, and sun are nearly in a straight line, — the moon and sun pull together. They then make the tidal wave higher than at the quarter, when the sun is pulling in one direction and the moon in another. The high range of tides at full and new moon are called *spring* tides; those at the quarters, *neap* tides.

4. Effects of tides

In the open ocean, the tides are of little or no consequence. But along the coast, where the water rises and falls against the beaches and cliffs, they are of much importance. Where the coast is irregular, the tide is often changed to a *current*, which sometimes moves so rapidly that a sailing vessel cannot make headway against it, but must wait until the tide changes. Such a rapid current is found in one of the entrances to New York harbor, at what is known as Hell Gate, where the channel is narrow and rocky.

These tidal currents move in one direction during the incoming, or *flood*, tide, and in the opposite direction during the outgoing, or *ebb*, tide. They sometimes drift vessels out of their course and place them in dangerous positions. Many a ship has been wrecked upon a coast where it was drifted by the tidal currents.

The tidal currents often carry mud and sand hither and thither, building sand bars opposite the mouths of harbors. This is one of the reasons why the government is obliged to spend large sums of money every year in improving our harbors. For example, the tidal currents bring large quantities of sand into the mouth of New York harbor near Sandy Hook, and along the coast farther south.

(2) *Ocean Currents*

Main cause of ocean currents

The winds which blow over the ocean, forming waves, also drift the water before them. You yourself can cause such a movement, in a small way, by blowing on the surface of a pail of water. This starts a current, or drift, of surface water in the direction of the moving air. Where the winds blow steadily, as in the trade wind belts, there is a permanent drift of water, pushed along by the prevailing winds. In this way a great system of ocean currents is formed (Fig. 312), which have an important influence on the temperature of the earth.

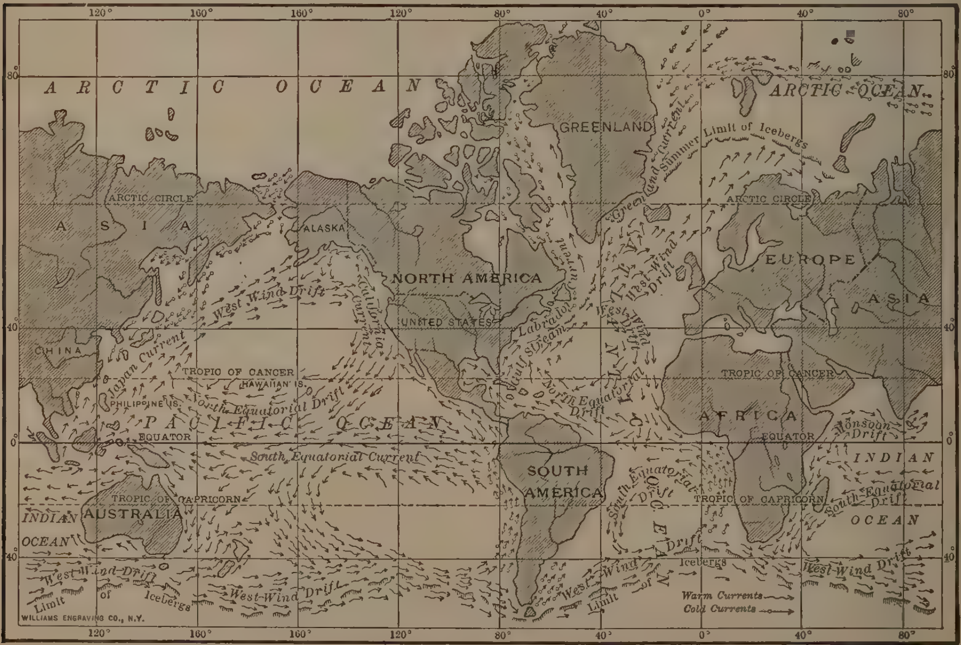


FIG. 312. — A chart showing the principal ocean currents and ocean drifts of the world.

In our study of North America it was several times necessary to refer to two of these currents, the Gulf Stream and the Labrador Current. We shall now study the ocean currents, on each side of our continent, more fully.

The North Atlantic Eddy

In the eastern part of the Atlantic, where the trade winds blow, the surface water on the two sides of the equator drifts slowly in the direction of the trade winds; that is, toward the belt of calms (Fig. 293). The water then moves westward, as a great *Equatorial Drift*, until it reaches the coast of South America which interferes with its course (Fig. 312). There the drift of water is divided, a part being turned southward, while the greater portion proceeds toward the northwest.

The part that flows northwest is turned toward the right by the effect of rotation, as the winds are (p. 208); and the part that flows into the South Atlantic is turned to the left, also by the effect of rotation. The northern drift keeps turning to the right, and therefore, instead of continuing along the American coast, swings out into the Atlantic toward Europe. Continuing to turn, it then passes southward, and finally returns to the trade wind belt, where it started, having made a complete circuit. This circular drift of water in the North Atlantic is called the *North Atlantic Eddy* (Figs. 312 and 313).

Coming from the equatorial region, the water in this huge eddy is warm, and in it live countless millions of animals and floating plants. Among the latter, one of the most abundant is a seaweed, called *Sargassum*, some of which is thrown into the middle of the great eddy. There it has collected until it now forms a *grassy*, or *Sargasso, sea*, hundreds of square miles in extent. Since the Sargasso Sea lies directly between Spain and the West Indies, Columbus was obliged to cross it on his first voyage of discovery; and his sailors, upon entering it, were much alarmed lest they might run aground, or become so entangled in the weed that they could not escape.

The Gulf Stream

A portion of the drift of water which moves toward the northwest along the northern coast of South America, enters the Caribbean Sea and then passes into the Gulf of Mexico. This forms a broad, deep, gently flowing current into these inclosed seas, which are so nearly surrounded by warm tropical lands that the water grows even warmer than it was before.

After swirling slowly round the Gulf of Mexico, the water escapes between Cuba and Florida. The current then becomes known as the *Gulf Stream* (Fig. 313), because it comes from the *Gulf* of Mexico. Being forced to pass out through so narrow an opening, its rate of movement is much increased, as water in a hose is made to increase its speed by passing through the nozzle. Measure the distance from Key West to Havana (Fig. 205). Near here the Gulf Stream flows as fast as four or five miles an hour.

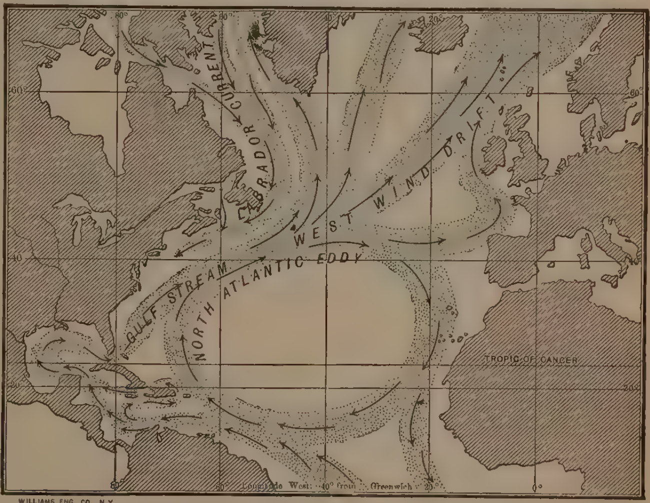


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FIG. 313. — A diagram to show the currents of the North Atlantic. In order to illustrate the currents clearly it has seemed necessary to make them as if they were sharply bounded, like a river in its channel. However, the boundaries of these great currents and drifts are so indefinite that one would not be able to detect the boundaries.

Being turned to the right by the effect of the earth's rotation, the Gulf Stream soon leaves the American coast and flows northeast toward northern Europe. It broadens rapidly and joins forces with the western part of the great North Atlantic Eddy. In crossing the Atlantic, this combined current, or drift, is pushed along by the prevailing westerlies, so that it reaches the shores of northern Europe, and even enters the Arctic Ocean. In this part of its course the current is called the *West Wind Drift*. Some idea of its volume may be gained from the fact that it carries many times as much water as all the rivers of the world together.

The Labrador Current

Some of this water returns in a cold surface current, called the *Labrador Current*, which flows southward along our northeastern coast (Fig. 313). Starting from among the islands of northern North America, the Labrador Current flows past the coast of Labrador, Newfoundland, Nova Scotia, and New England as far as Cape Cod. Like all ocean currents in the northern hemisphere, it is turned toward the right; that is, since it flows southward, toward the west. This causes it to follow our coast very closely, keeping nearer our shore than the Gulf Stream does.

Since there are two currents near together, a cold one from the north, and a warm one from the south, a vessel sailing from Boston to England must cross both. In winter, during a storm, a ship often becomes covered with snow and ice while in the cold Labrador Current; but soon after entering the warm current this all melts away.

Where the cold and warm currents approach each other, dense fogs are common. The reason for this is that warm, humid winds from the Gulf Stream are chilled in crossing the Labrador Current. This causes some of the vapor to condense and form fog particles. The region near the coast of Nova Scotia and Newfoundland is one of the foggiest regions in the world, and therefore dangerous to vessels.

Currents in the North Pacific

In the Pacific Ocean, as in the Atlantic (Fig. 312), the water is driven before the trade winds. Thus a broad drift is formed, moving westward in the belt of calms. Then a warm current swings to the right past Japan, crossing the ocean toward Alaska. This is called the *Japanese Current*. Continuing to turn to the right, this ocean drift passes southward to complete the vast eddy. There is also a cold current from the north, between the Japanese Current and the coast of Asia, corresponding to the Labrador Current in the Atlantic, though smaller and not so cold.

From what has been said, we see that the *northeastern* coasts of both North America and Asia are swept by ocean currents from the cold north. On the other hand, the *northwestern* coasts of Europe and North America are approached by warm drifts of water from the south.

Eddies of the southern oceans

In the South Atlantic, South Pacific, and Indian oceans, there are eddies similar to those of the North Atlantic and the North Pacific. There is one very important difference, however. In the southern hemisphere the currents are turned to the *left*, instead of the right, by the effect of rotation. Some of the water of these eddies joins the broad *West Wind Drift* of the distant southern ocean; but much of it turns northward until it once more reaches the trade wind belt, thus completing the eddies (Fig. 312).

Effects of ocean currents on North America

1. Effects of Labrador Current

The cold Labrador Current greatly influences the temperature upon the neighboring land; for winds that blow over the Labrador Current are cooled, and carry the chill far inland. This is one of the reasons why the east winds of New England are so cool, and why the New England coast is such an agreeable summer resort.

The Labrador Current bears with it much ice from the Arctic region. Some of this is sea ice, or "floe ice," which has been frozen during the preceding winters, and some of it is in the form of gigantic icebergs which have broken off from the Greenland Glacier. Seals are commonly seen in the floe ice, and occasionally a polar bear, which preys upon the seal (Fig. 314).

Most of the sea ice melts before reaching Newfoundland; but the icebergs may be carried southward one or two thousand miles before the air and water melt them away. (See limit of icebergs on Figure 312.) Indeed, some icebergs float even as far south as the paths followed by vessels which cross the Atlantic. Since many of these bergs are larger than a large building, collision with one means shipwreck; therefore sailors need to use great caution, especially when a ship is in the fog.

2. Effects of the Gulf Stream

While winds from over the Labrador Current are chilly, those that blow from over the Gulf Stream are warm. They are also humid. During cyclonic storms, winds from the warm waters off our southern coast often carry both warmth and moisture far into the interior of the country. These winds greatly temper the climate of our Eastern and Central states, so that the Gulf Stream, as well as the Labrador Current, has an important influence on our climate.

3. Effects of warm currents in the North Pacific

The winds that blow over the warm waters of the North Pacific cause the climate of the Alaskan coast to be far warmer than that of southern Labrador in the same latitude. These prevailing west winds also bring an abundance of vapor to the Pacific coast, all the way from California to Alaska.

Where these winds blow, the winters are mild and the rain ıeavy; but the summers are ool, because the ocean water, hough warmed, does not beome greatly heated. On a globe notice hat the state of Washington, with its leasant climate, is in about the same latiude as the bleak island of Newfoundland, vhose shores are bathed by the Labrador Current.

ffects of curents in other egions

. On the Arctic cean

The warm West Wind Drift of the North Atlantic is of special benefit to the Old World. When Nansen started on his famous journey toward the north pole, he entered the Arctic Ocean where this current does. He vas able to proceed much farther north han would have been possible along any ther route, because the warm drift of vater keeps this part of the Arctic free rom ice in summer. Notice, on Figure 312, ow much farther north the limit of iceergs is on the coast of Europe than on the merican coast.

. On western urope

The west winds, warmed in passing over the West Wind Drift, have made possible the great civilized nations of northern Europe. Notice on a map, how many large cities of northern Europe are in the same latitude as desolate Labrador. How different these two regions are! One is highly civilized and densely settled; the other is occupied only by scattered savages. This difference is due largely to the ocean currents and the winds that blow over them.

FIG. 314. — A polar bear hunting seal on the floe ice that is floating southward in the Labrador current.

When our first settlers came from England, they expected to find, in the New World, a climate like their own in the same latitude. They were not prepared for the severe winters which they did find; and largely for that reason the first settlements on the New England and Canadian coasts were failures.

3. On northeastern Asia

The cold current off the northeastern coast of Asia affects that region much as the Labrador Current does northeastern North America. The winds that blow over it chill the Siberian coast, and cause the harbors, like that of Vladivostok, to be icebound in winter. This explains why Russia desired to hold the Chinese harbor at Port Arthur, south of Korea, as a terminus of the Siberian railway, — so that her commerce and war ships might not be shut up in winter by ice.

2. Distribution of Temperature

As a rule, the farther north one travels from the equator, the colder it grows; but this is by no means always the case. As we have seen, there are several causes which interfere with this regular decrease in temperature toward the poles.

Why places in the same latitude may have different temperatures

The presence of highlands is one cause. It is a well-known fact that high mountains have a cold climate, even though in the torrid zone; and, for the same reason, plateaus may be colder than the lowlands farther north.

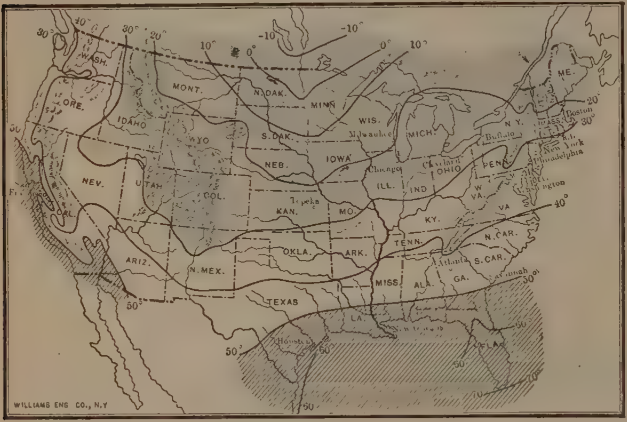


FIG. 315.—Isothermal chart of the United States for January. Why is it colder in the interior than on the east coast? Why so warm on the west coast? Can you notice any influence of mountains?

A second cause is the fact that land warms and cools much more rapidly than water (p. 217). This is the reason why land becomes hotter than the ocean in summer, and colder in winter. Thus, in northern Minnesota, far from the ocean, the average temperature in January is below zero, while in July it is about 65° (Figs. 315 and 316). In New York City, on the seacoast, the average in January is about 25° and in July not quite 75°. Thus the difference between the summer and winter months in northern Minnesota is more than 65°, while at New York City it is not over 50°.

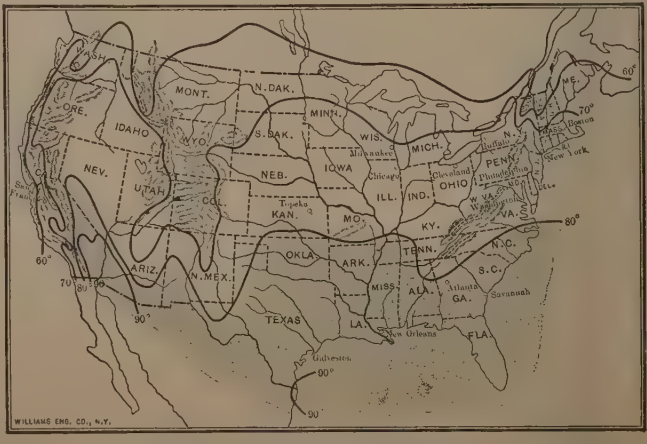


FIG. 316.—Isothermal chart of the United States for July. Why is it cooler on the west coast than on the east coast?

The winds are a third cause greatly influencing the temperature. Where the prevailing winds are from the ocean, they cause an equable climate, as in California, near San Francisco and farther north. Where they blow from the land, on the other hand, they are cool or cold in winter, and warm or hot in summer.

A fourth cause for such difference in temperature is found in the ocean currents, as you have just seen. Give several examples of the influence of ocean currents.

Meaning of isothermal lines, and their value

If, therefore, we were to draw a line across the continent of North America, connecting several points that have the same average temperature during any one month, or during the entire year, it would need to be a very irregular one, with some parts reaching much farther north than others. Such lines tell so much about temperature, in so little space, that it is the custom to make maps to show them, as in Figures 315 and 316. Since these lines connect the places that have the same temperature, they are called *isothermal lines*, or *isotherms* (*iso* means equal; *thermal*, heat). A map or *chart*, showing the isotherms, is called an *isothermal chart* (Figs. 315 and 316).

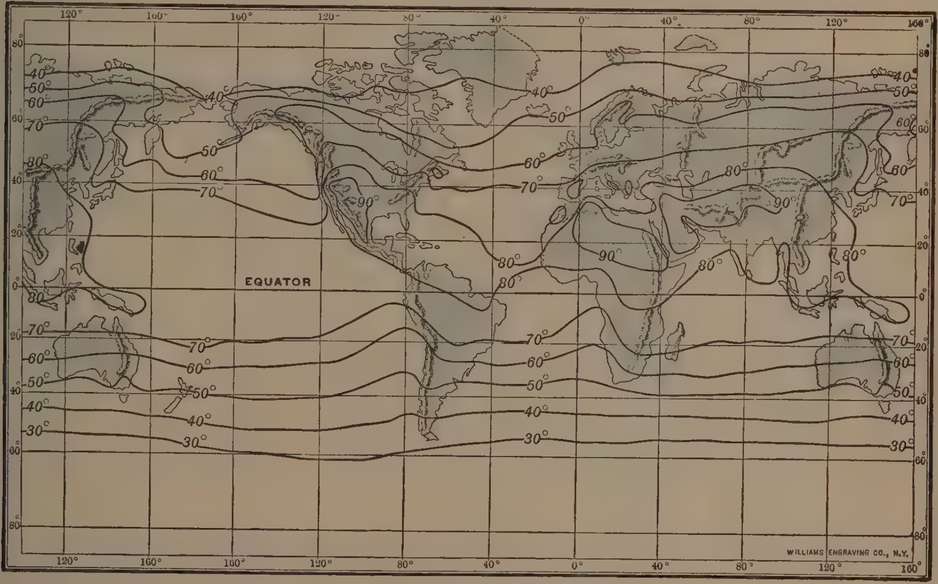


FIG. 317. — An isothermal chart of the world for July.

Differences between January and July isotherms on land, with reasons

Trace several of the isotherms across the United States and explain why they bend as they do. Note that the isotherms on the western coast extend north and south, almost parallel to the coast. This is because the prevailing westerlies bring the nearly uniform temperature of the Pacific Ocean to the land. There is only about 20° difference between the winter and summer temperatures on the western coast; but on the eastern coast of the United States the difference between summer and winter is much greater. Here, while some of the winds are from the ocean, still more are from the land, which is cold in winter and warm in summer.

Figures 317 and 318 show similar isotherms for the whole world. Observe how these bend toward the equator where they cross mountain chains. Comparing these two figures, you will notice that the winter isotherms of the north temperate zone bend toward the equator over the continents. This is because the land is colder than the ocean. During the summer, on the contrary, the isotherms curve poleward on the continents. On what continent are these bends most striking? Why? What effect of the West Wind Drift do you find in Figure 318?

Their differences on the oceans, with reasons

Notice also that the isotherms of the North Atlantic are close together as they leave America, but spread apart, like a fan, toward the Old World. On the American side, the ocean currents approach each other, one from the north, bearing Arctic cold, the other from the warm south. This causes a great difference in temperature between our northern and southern coasts. On the European side of the Atlantic, on the other hand, one part of the warm West Wind Drift passes northward, raising the temperature and bending the isotherms far northward. Another part of the current turns southward. This water, flowing into a warmer region, is somewhat cooler than the surrounding water. It therefore lowers the temperature and causes the isotherms to bend southward. Thus the isotherms are spread apart.

In the southern hemisphere, where there is less land, these differences are not nearly so striking. You can, however, find some bends of the isotherms near South America, Africa, and Australia. But south of these continents, where it is all water, the isotherms run nearly east and west, almost parallel to the circles of latitude.

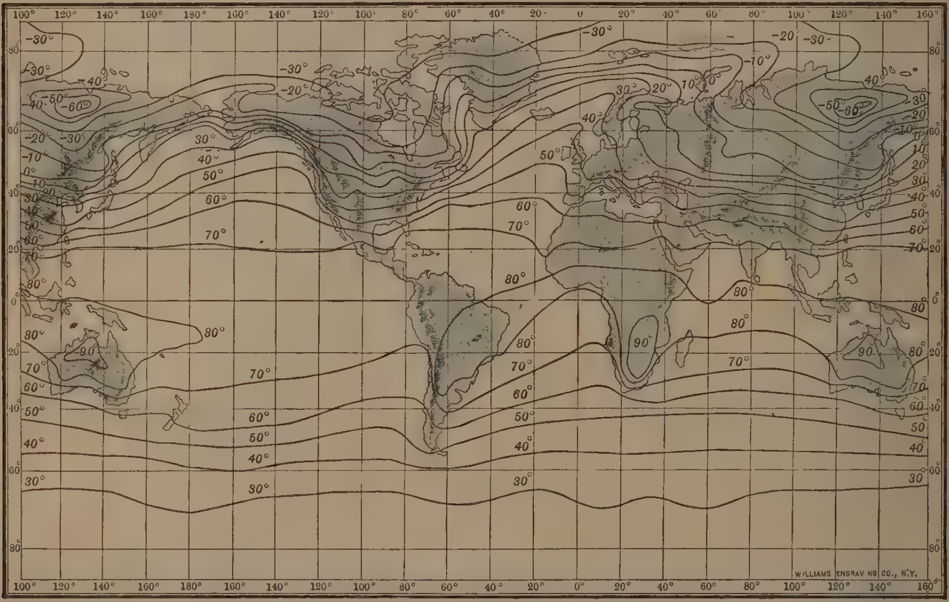


Fig. 318. — An isothermal chart of the world for January.

Review Questions

1. What are the three principal movements of ocean water? 2. Tell what you can about the wind waves. 3. What are tides? 4. Explain their cause. 5. What about their height? 6. Mention some of their important effects. 7. Explain the main cause of ocean currents. 8. Describe the North Atlantic Eddy. 9. The Gulf Stream. 10. The Labrador Current. 11. The currents in the North Pacific. 12. The eddies of the southern oceans. 13. Explain the effects of the Labrador Current on North America. 14. Of the Gulf Stream. 15. Of the warm currents in the North Pacific. 16. State the effects of ocean currents on the Arctic Ocean. 17. On western Europe. 18. On northeastern Asia. 19. Give four reasons why places in the same latitude may have different temperatures. 20. What are isothermal lines, and what is their value? 21. What are isothermal charts? 22. Trace some of the isothermal lines across the United States for January and for July, and explain their differences. 23. Explain the direction of isotherms on the North Atlantic. 24. Find on the maps other bends of the isotherms in crossing the ocean, and account for them. 25. Why are the isotherms so much more nearly parallel in the southern than in the northern hemisphere?

Suggestions

1. If your home is upon the seacoast, find out about the high and low tides there. 2. What course might a vessel take in order to be carried from Europe to America, and back again by ocean currents? 3. How do vessels try to avoid running into one another in dense fogs? 4. Learn more about Nansen's voyage. 5. Which of the isothermal lines on Figures 315 and 316 is nearest to your home? 6. Which isotherm on Figure 315 runs near New York and northern New Mexico? 7. On Figure 316, what isotherm runs through northern Maine and San Francisco? 8. How about the distance of these points from the equator? 9. Locate the cold ocean currents of the world; the warm currents. 10. Estimate the length of the circumference of the great eddy in the North Pacific. 11. How does Figure 318 show the effect of the warm current on the northern coast of Russia?

V. PLANTS, ANIMALS, AND PEOPLES OF THE EARTH

1. Plants and Animals

Life in the frigid zone

In our study of North America (p. 14) we found that there was little plant and animal life in the northern part of the continent. Give the reasons. What plants are found there? What about insect life? What large land animals are found, and how do they manage to live?

The life upon the *tundras* of northern Europe and Asia corresponds closely to that on the *barrens* of North America; and the few people found there live in much the same way as the Eskimos of North America. Besides the dog, however, the people of the tundras have the reindeer as a domestic animal (Fig. 319).

ife in the orrid zone

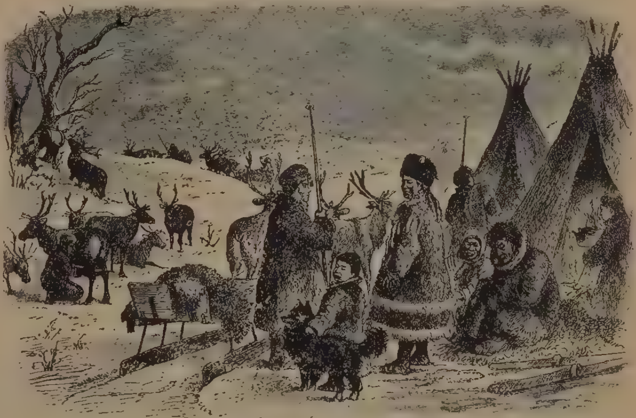
What countries of the New World are at least partly included within the tor-id zone (Fig. 285)? De-cribe the climate of this art of North America (p. 19). What bout the plant life found there (p. 19)? The animal life (p. 22)?

In the rainy ection

What portions of the Old World lie in he torrid zone? Extensive and dense forests are found in the rainy section of this zone in the ld World, as in the New. Animal life is bundant, too, since there is so much ood.

Among the animals insects are especially ommon. Some, like the beautiful butter-ies, thrive because of the great number and ariety of tropical flowers; others, like any species of ants, live in the decaying ood; and still others have their homes in he ground. Some are harmless; but many, like the ants, which swarm in vast numbers, are very troublesome.

There are many birds, too, including humming birds, parrots, paroquets, birds of paradise, and other species, which are far famed for their beauty. Among the mammals there is less variety and abundance. Some, like the monkeys and sloths (Fig. 339), are tree dwellers; others, like the tapir, live in the swampy undergrowth. Some very large animals, such as the rhinoceros and elephant (Fig. 460), still live in the dense forest, where it is difficult to hunt them. Occasionally, too, fierce animals, such as the tiger (Fig. 320), lurk in the densely growing vegetation, ready to pounce upon the more defenseless, plant-eating animals.



From Ratzel's History of Mankind.

FIG. 319. — A camp in the tundra of northern Asia. The reindeer are used for drawing the sleighs and also as a source of milk and meat.

Reptiles also thrive in the warmth and dampness of the forests. Great boa constrictors twine themselves, like huge vines, among the trees and underbrush; and poisonous serpents are common. The bodies of standing water encourage water life, — for example, the turtle and alligator among reptiles, and the hippopotamus and manatee among mammals.

The labor required to clear away the dense tropical forest, and to keep it clear for farming, is far greater than in the temperate region of our country. This difficulty is increased, too, by the extreme heat, and by the damp, unhealthful climate. For these reasons, in spite of the very fertile soil, the zone of dense tropical forests is almost everywhere sparsely inhabited; and in nearly every case its inhabitants are indolent savages. They have become accustomed to the climate, and they easily secure an abundant supply of food from the surrounding trees and bushes. Thus they find little work necessary.

FIG. 320. — The tiger which lurks in the jungles of India.

2. In the savannas

On either side of the tropical forest there is a belt where the temperature is always high, but where the rainfall varies with the season. Here abundant rain falls in one season, while the climate is very dry in the opposite season (p. 214). Owing to the lack of rain during one season, dense forests are impossible; but some plants, such as grasses, thrive. These are therefore grass-covered lands, and are known as *savannas*.

The *downs* of northern Australia, the *park lands* lying both north and south of the equator in Africa, the *campos* of Brazil, and the *llanos* of Venezuela and Colombia, are all examples of savannas. They are dry and barren in one season, fresh and green in the other. Trees, such as palms, line the streams; but elsewhere the land is open prairie. Plant-eating animals roam about; in Africa, for example, the antelope, gazelle, zebra, giraffe, buffalo, elephant, and

FIG. 321. — The lion, sometimes called the king of animals.

rhinoceros. In addition, there are some flesh-eating animals, such as the lion (Fig. 321).

While tropical forests are suited only to the life of indolent savages, the open savannas invite human inhabitants, in spite of the heat. They also *compel* industry, because men must make provision for the period of drought. Therefore, even those African negroes who inhabit the grass lands keep flocks and carry on rude forms of agriculture. Where settled by white men, these savannas are to-day mainly grazing lands.

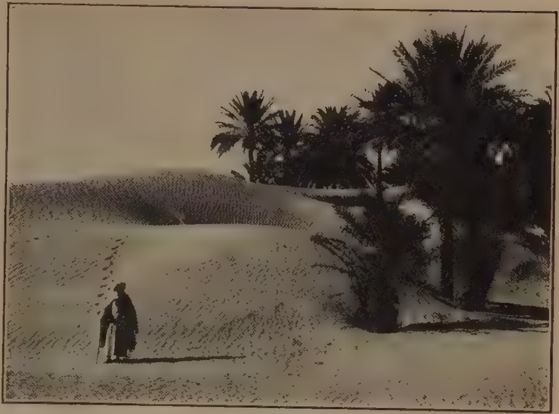


FIG. 322. — Sand dunes on the edge of an oasis in the Sahara desert.

3. In the desert

The savannas grade into tropical forests on the side next to the equator, but they gradually change into deserts on the other side. Locate these deserts in Australia south of the equator; in Asia north of the equator; and in Africa and America on both sides of the equator (Figs. 296, 298, 299 and 300). Explain the causes of their arid climate.

In the desert there are vast areas in which the and is drifted before the wind and piled into sand ills, or *sand dunes* (Fig. 322). There are also tracts listening with salt where the water of lakes has vaporated and left salt upon the surface. Parts f the desert are broad plains; but there are also tony plateaus, deep valleys, and mountain ranges.

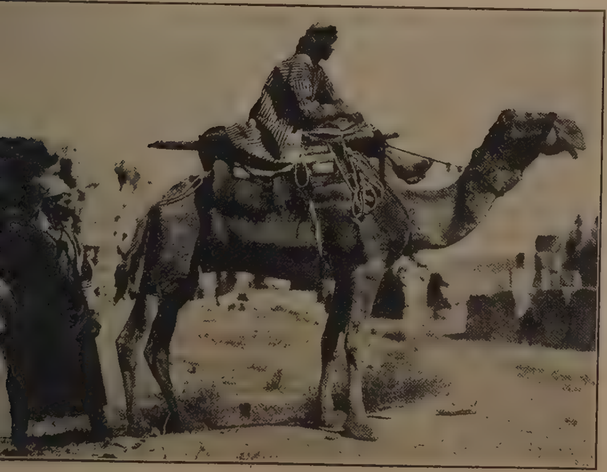


FIG. 323. — A camel on the desert of northern Africa.

Throughout most of the desert there is such a lack of rain that the surface is barren and desolate at all times.

Even in such a region, however, plants and animals are not entirely lacking. In some sections there are scattered clumps of coarse grass; and there are prickly plants, like the cactus, in which the leaves and stems are as compact as possible to prevent evaporation. In place of a dense tropical foliage, like that of the tropical forest, there is a notable absence of leaves. Indeed, a large part of the plant is under ground. This is because the roots must struggle hard to find the necessary moisture, and the portion above ground must use as little moisture as possible, and waste none; for years may pass before rain comes.

That the desert soil is usually fertile is proved by the fact that vegetation thrives wherever there is fresh water, as along a stream. Such watered spots in the desert are called *oases*. They make beautiful gardens in the midst of the barren desert.

One of the few large animals native to the deserts of the Old World is the ostrich. Another, much used by man, is the camel (Fig. 323). The camel well illustrates how animals become adapted to their surroundings. Each foot has a broad sole which aids the camel in traveling by preventing the feet from sinking into the sand. The nostrils can be closed when necessary, and the eyes are protected by thick lashes. Both of these devices help to keep out the sand, which is so often blown about. The camel is further provided with pouches in which enough water may be stored to serve its needs for two or three days. It also has a fatty hump, which furnishes nourishment to the body, so that the camel can go without food longer than most other animals.

Human beings naturally shun the desert. Permanent homes can exist only on the oases (Fig. 322); but wandering tribes, or *nomads*, roam about over the desert. They live in tents (Fig. 324), and are engaged either in herding, or in driving caravans of camels laden with articles of trade.

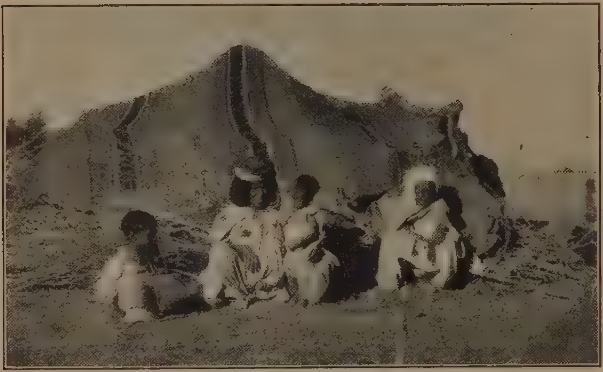


FIG. 324. — A family of nomads and their tent on the Sahara desert in Morocco.

Life in the temperate zones

What part of North America is included within the north temperate zone? What part of the Old World? What countries of South America are at least partly included within the south temperate zone? What part of Africa? Of Australia?

1. In the well-watered sections

The land of the temperate zones is in large part forest-covered. Thus a broad forest belt crosses the northern interiors of both North America and Eurasia. Owing to the moderate rainfall in some parts, and to the rigor of the climate in others, the forest is more open than in the tropical zone.

In the forests near the torrid zone, the trees are for the most part tropical in kind. In the cooler parts, however, they are mainly of two sorts: (1) the *evergreens*, including the pine, spruce, and hemlock, which have needle-like leaves that remain green throughout the winter; and (2) the *deciduous* trees, like the oak, maple, elm, and chestnut, whose leaves are much larger, but fall when frost comes. The temperate forest was the home of many wild animals, but these have now been greatly reduced in number. Name some of those of North America (p. 17). Owing to the coldness of the climate in the northern sections, these animals are protected by fur, which men find of much use.

There are some treeless plains even in those parts of the temperate zone where the rainfall is heavy enough for tree growth. Examples of these are the *prairies* in the United States and some of the plains in southern Russia. What has been said about the cause of prairies (p. 19)?

In the temperate zones of the northern and southern hemisphere both the cleared forest lands and the humid, grass-covered plains have become the seats of extensive agriculture. In fact, the temperate zones are the agricultural regions of the world, and they might almost be called the *zones of grain* (Figs. 535, 536). Make a list of the grains that are cultivated; also of the fruits.

It is in the temperate zones, too, where man has developed most highly. The simple life of the savage in the tropical forest, and of the Eskimo in the cold regions, offers a striking contrast to the varied life of the agricultural people in the temperate belt. Not only are the latter more highly civilized, but they have so increased in

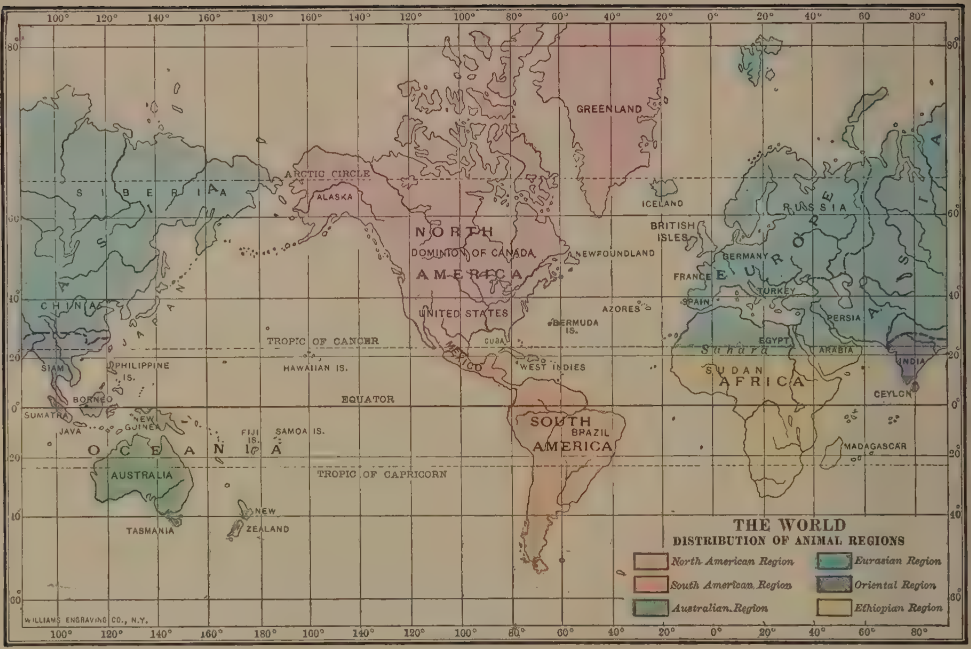


FIG. 325.

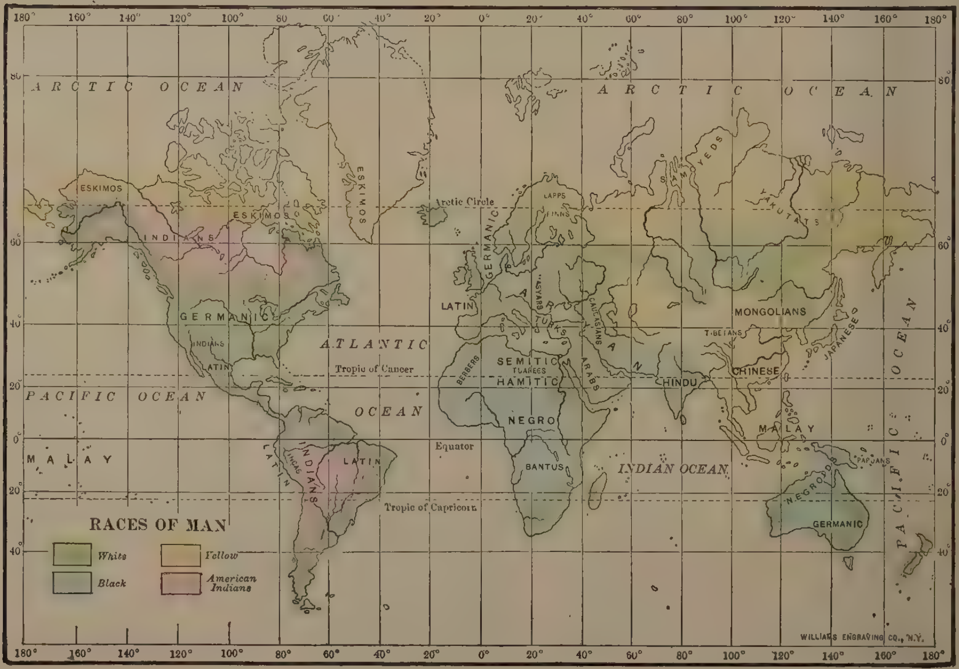


FIG. 326.

numbers that the temperate zone is the most densely populated belt in the world. Suggest some reasons for this.

3. In the arid ands

In addition to the prairies there are other treeless, grass-covered lands in the temperate belts. These are usually in the interior of coninents, on the border of the deserts, where he rainfall is light. In the Old World, where these arid tracts are called *teppes*, there is a broad strip of reeless land extending from southastern Europe to central Asia. The *Great Plains* of western North America, and the treeless plains, r *pampas*, of Argentina are also teppes (Fig. 346).

On these steppes the melting snow nd the spring rains cause the grass to e green in spring and early summer; ut drought then changes it to gray nd yellow. There are no trees xcepting along the streams; and here is too little rainfall for agriulture without irrigation.

The wild animals are mainly rass eaters. Formerly the steppes upported great herds of deer, ntelope, and bison; but cattle, heep, horses, and camels have ow largely taken their place. n the Old World the inhabants of the steppes have for any centuries led a pastoral fe, and have become nomads. hey wander about, living in nts during the summer; ut in winter they build ore permanent homes for e sake of protection against e weather.

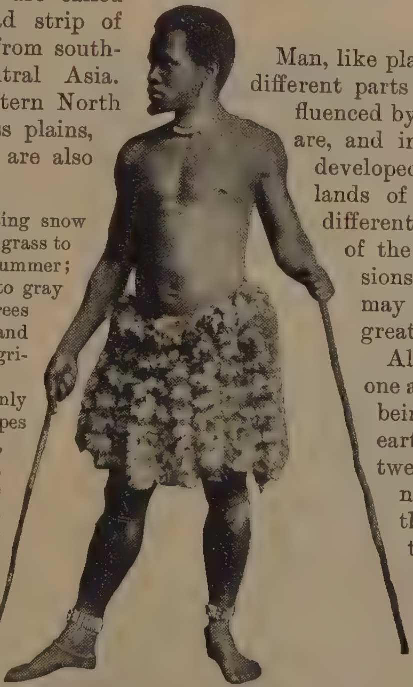


FIG. 327.—A Zulu, one of the tribes of African negroes.

stribution of imals and ants

The kinds of plants and animals are not e same in different sections of the world. Thus, the native animals and plants of Australia are quite different from those of Asia or merica. There are several reasons why ey do not naturally spread all over the rth. One of the most important of these that the ocean is in the way. It is a *rrier* that they cannot easily cross. Mountains and deserts are other barriers. Thus, lands that are separated by such barriers are quite apt to have different kinds of animals and plants; while lands that are connected, or that were formerly connected, have animals (*fauna*) and plants (*flora*) more nearly alike. The map (Fig. 325) shows the different zones of animal life in the world. What are their names?

2. Peoples

Man, like plants and animals, varies in different parts of the world. He is influenced by his surroundings, as they are, and in the course of time has developed differently in the various lands of the earth. People hold different views about the *origin* of the human race and its divisions, but mankind in general may be divided into the four great groups described below.

Principal divisions of mankind

1. Ethiopians

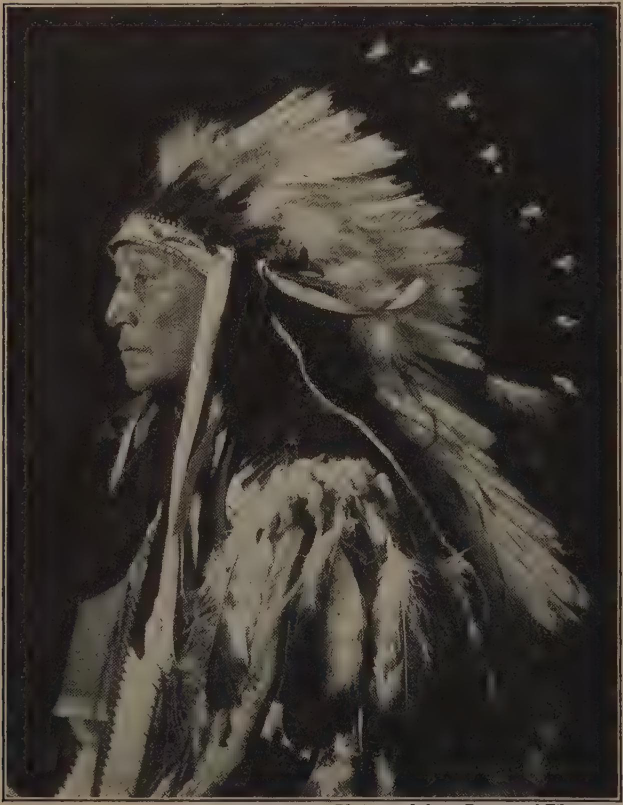
All together there are over one and one half billion human beings upon the earth, or nearly twenty times the number in the United States. Of these, over one hundred and eighty-five million are negroes (Figs. 326 and 327), or *Ethiopians*. This is often called the black race. There are many divisions of this group, but they all have a deep brown or black skin; short, black, woolly hair; broad, flat noses; and prominent cheek bones.

The home of the Ethiopians is Africa, south of the Sahara Desert (Fig. 326), though many have been carried to other lands as slaves, and have there mingled more or less with the other races. The negroes in Africa are either savages, or barbarians of low type; but in other lands they have often advanced to a civilized state.

The native Australians (Fig. 523), the Papuans of New Guinea, the Negritos of the Philippines, and the blacks on some other islands in that part of the world, resemble the negroes most closely, though differing from them in some important respects. They are shorter; their hair is less woolly, their noses straighter, and their lips less thick.

2. American Indians

A second great division of the human race is that of the *American Indians*, often called the *red race* (pp. 22–24). It is the smallest of the four groups, numbering only about fifteen million. These people, who in some respects resemble the Mongolians, were in possession of both North and South America when Columbus discovered the New World. They are distinguished by a copper-colored skin, prominent cheek bones, black eyes, and long, coarse, black hair (Figs. 326 and 328).



Photograph from Bureau of Ethnology.

Fig. 328. — A North American Indian, one of the red race.

3. Mongolians

The third division, the *Mongolian*, or *yellow race*, numbers about six hundred and thirty million. They are mainly Asiatic people, though some, like the Finns, Lapps, and Turks, have migrated to Europe.

The Mongolians, as represented by the Chinese and Japanese (Figs. 326 and 330), have a yellowish, or in some cases even a white, skin, prominent cheek bones, small oblique eyes, a small nose, and long, coarse, black hair. The Malays are a division of the yellow race. The great majority of Mongolians are civilized, although their kind of civilization differs from that of the white race.

4. Caucasians

By far the largest and most civilized of the four divisions of mankind is the *white*, or *Caucasian, race*, which numbers about six hundred and ninety million. They are also the most widely scattered, being found now in great numbers on all the continents. Their original home is not known.

While they differ greatly from one another, two main branches are recognized: (1) the fair type, with florid complexion, light brown, flaxen, or red hair, blue or gray eyes, and height above the average; (2) the dark type, with fair skin, dark brown or black hair, often wavy or curly, and black eyes.

The leaders among these races are the whites, who, having learned the use of ships in exploring distant lands, have

xtent to vhich the Cau-asians are eaders, with easons

pread with great rapidity. Being more dvanced than the other races, the white race has conquered the weaker people and taken their lands from them, so that now they rule almost the whole world (Fig. 326). The only divi-ion that has held out against them is that f the Mongolians, whose very numbers ave in large measure served to protect hem.

orms of re-gion, and heir distribu-on

Superstition

Every race has some form of religion. mong ignorant savages it is little more than superstition. They are surrounded by nature, which they do not understand. They seek a cause and, seeing none, are led to believe in spirits. ome of these are supposed to be evil, others good. Believing that these spirits have great influence over their lives, they try to win favor with them by offering sacrifices and worshiping them.

Such religion — if it may be so called — takes many forms. Some races believe in witchcraft; and among them the witch doctor is sometimes more powerful than the ruler himself. To ward off evil influences, charms are worn, curious rites are observed, and images or other objects, called *fetishes* (Fig. 328), are worshiped because they are believed to possess some magic power. Among these objects are included fire, the sun, the earthquake, and many animals. They have little or no idea of God.

All people with some such views as these are often said to have *no* religion. From our point of view they have no *true* igion; but they have something related to it.

atzel's History of Mankind.

. 329.— A negro tish from Africa.

Among the civilized races there are rms of belief in which the idea of God much higher, and in which the doctrine of future reward and punishment is taught. Of these religions five call for special mention.

2. Buddhism

Buddhism, followed especially in eastern Asia (Fig. 332), was established in India five or six hundred years before the time of Christ. It was the result of the work and teachings of Buddha (Fig. 331). There are many differences in the religious beliefs and customs of the people who follow Buddha, and in consequence there are many sects.

Fig. 330.— Japanese women, belonging to the Mongolian or yellow race.

3. Brahmanism

Brahmanism is one of the most common forms of belief in India and other parts of Asia. It would be difficult to correctly describe the religions of the Asiatic people in a few words; but *idolatry*, or the worship of idols, is common among them. *Ancestor worship* is common in China; and the *doctrine of caste* in India, — that is, the doctrine of class dis-

FIG. 331. — A great statue of Buddha.

tinction. Both of these doctrines, which are a part of their religion, are opposed to progress, as you will learn later (pp. 355 and 363).

4. The Jewish religion

The *Jewish* religion, still followed by large numbers of people, upholds the worship of one righteous God as taught in the Old Testament; but they reject the New Testament.

5. Mohammedanism

The prophet Mohammed lived about six centuries after Christ, and the *Koran* contains his teachings. Mohammedans deny that Christ was divine. This religion has spread by the sword with wonderful rapidity, especially among the half-civilized people of Asia and Africa (Fig. 332). Many of its followers became fanatics who, believing that they thus obtained future happiness, willingly died if they could die killing a Christian.

6. Christianity, and its value

The Christian religion, the common belief in America and most of Europe, has spread far and wide, until it now numbers nearly four hundred and eighty million followers. Its success, however, must not be measured by numbers alone; for nearly all of the most civilized

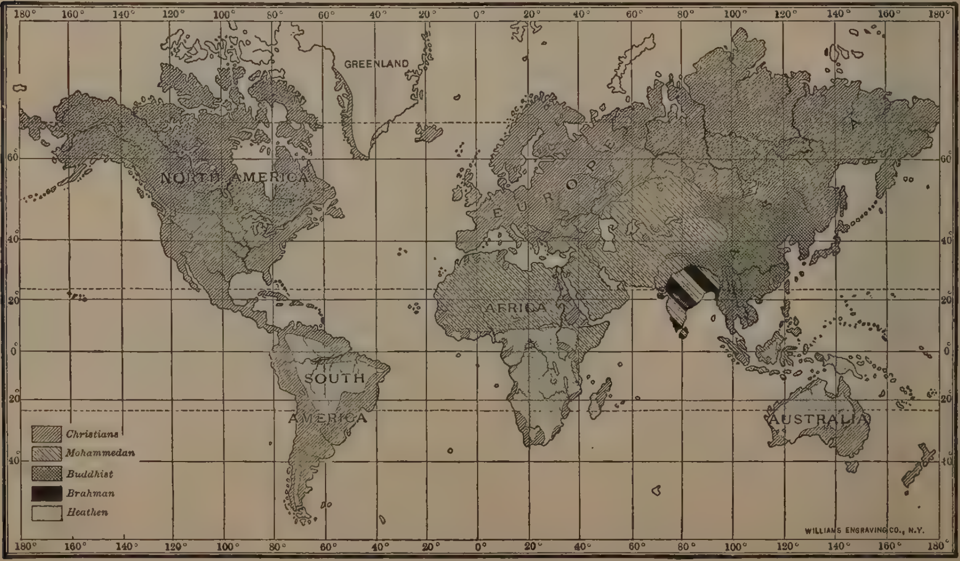


FIG. 332. — Map of religions of the world.

nations of the world are Christian nations (Fig. 332). It is no accident that this is so, for Christianity has been one of the chief factors in making civilization possible.

Religious belief has had much to do with nventions and the growth of industry. The Chinese, for example, have long opposed new inventions because their ancestor worship led them to have too much reverence for past customs. Partly for such reasons, our study of geography is chiefly concerned vith Christian countries; for there it is that ve find the most varied and extensive uses f the earth in the service of man.

eview uestions

1. What are the conditions of plant and animal life in the frigid zone? 2. In the rainy portion of the torrid zone? 3. In the savannas? 4. In the desert ortions of the torrid zone? 5. In the well-watered portions of the temperate zones? 6. In the arid lands of the temperate zones? 7. What about the distribution of animals and plants? 8. Tell what you can about the Ethiopians; their characteristics and distribution. 9. Do the same for the American Indians. 10. Mongolians. 11. Caucasians. 12. To what extent are the Caucasians leaders among these races? Give reasons. 13. Name the principal forms of religion. 14. Give some facts about religious superstition. 15. Buddhism and Brahmanism. 16. Jewish religion. 17. Mohammedanism. 18. Christianity.

Suggestions

1. Make a collection of different kinds of wood. 2. Notice how some of them are polished for use as furniture. 3. Visit a museum to see specimens of tropical animals. 4. Examine a cactus closely. 5. Examine and compare the foliage of some evergreens and deciduous trees. 6. Collect pictures of animals belonging to different parts of the world. 7. How many of the four divisions of mankind are represented in your own neighborhood? 8. Collect pictures for the school, showing the kinds of dress worn by the different races of mankind.

PART III. SOUTH AMERICA

Map Study

In what zones does South America lie? 2. What climate would you expect in the northern part? In the central part? In the southern part? 3. During what months does winter come in the extreme south? 4. What large rivers drain the continent? 5. Do you find many lakes? Suggest a reason. 6. To what extent is the coast line irregular? 7. Draw an outline map and locate upon it the mountains and rivers. Add the boundary lines of the principal countries. 8. Where are most of the islands? 9. Find Cape Horn. It is south of what island? What strait separates this island from the mainland? 10. Which country has most railways? What does this indicate about the people there? 11. In what zone is that country? How may the climate there have influenced the building of railways?

I. General Facts

Surface features

1. Resemblance between North and South America

Recall the shape of North America. Locate its two main highland masses. What are their names? Which is the higher and more extensive? What about its volcanoes? Where are its principal plains?

As you can see from the map, South America is quite like North America in its surface features. South America, like North America, is triangular in shape, being broad at the north and tapering toward the south. Its principal highlands are on the two sides, as in North America (Fig. 10). The western highlands, called the *Andes* (Fig. 334), form one of the loftiest mountain systems in the world; and between the ranges are many deep valleys and some lofty plateaus, as in our western Cordillera. From the northern to the southern end of South America, those mountains rise from the very seacoast, and extend far inland.

Many of the highest peaks are volcanic cones, one of them, Aconcagua, in Argentina, reaching an elevation of nearly twenty-three thousand feet. This is one of the loftiest peaks in the world. Several of the volcanoes are still active, and some of the eruptions have been terribly violent. Earthquakes, too, are frequently felt in this region.

The most extensive highlands on the eastern side of South America are in eastern Brazil (Fig. 334). Like New England, this is a region of high hills and low mountains. The highest point is a little over ten thousand feet above sea level. The Guiana highland (Fig. 334), between the Amazon and Orinoco rivers, resembles the upland of Brazil, but is separated from it by the Amazon Valley. The remainder of the continent is lowland (Fig. 335), and mainly a vast plain, extending from southern Argentina to the Caribbean Sea.

2. Differences between North and South America

Although the surface features of the two continents are so much alike, there are two important differences. In the first place, their large rivers flow in different directions from those of our continent. Describe the three principal river systems of North America (Fig. 9). Make a sketch of the three largest rivers of South America. One of these is the largest in the world. Which is it? Which one most nearly corresponds to the Mississippi in position and direction of flow?

A second important difference between the two continents is found in the coast lines. It will be remembered that much of the North American coast has been made irregular by the sinking of the land. Thus many good harbors have been formed. Much of the South American coast, on the

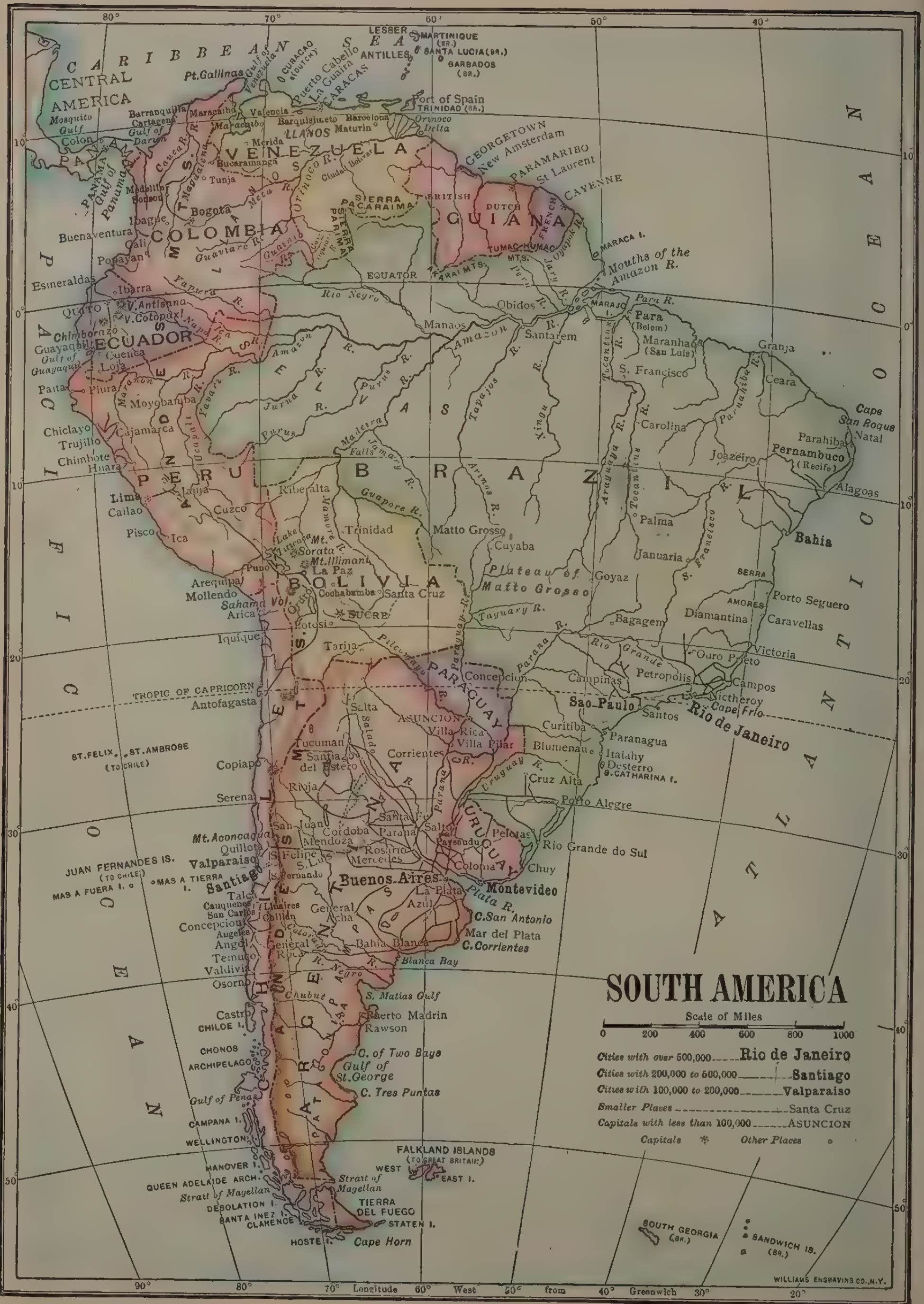


FIG. 333.
The boundary of Ecuador is in dispute.

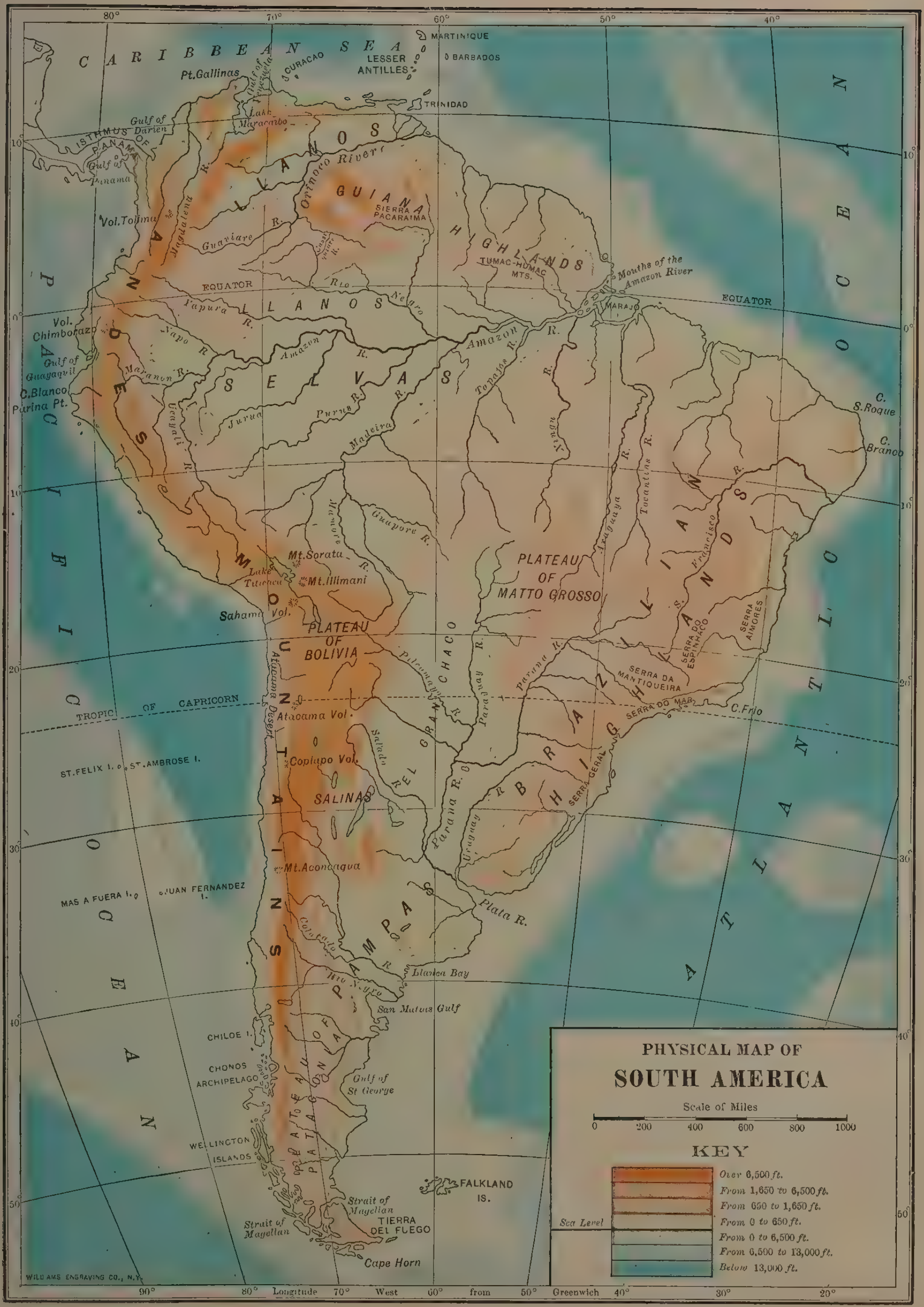

PHYSICAL MAP OF
SOUTH AMERICA
Scale of Miles
0
200
400
600
800
1000
KEY
Over 6,500 ft.
From 1,650 to 6,500 ft.
From 650 to 1,650 ft.
From 0 to 650 ft.
Sea Level
From 0 to 6,500 ft.
From 6,500 to 13,000 ft.
Below 13,000 ft.
CARIBBEAN SEA
MARTINIQUE
BARBADOS
LESSER ANTILLES
CURACAO
Pt.Gallinas
Gulf of Venezuela
Lake Maracaibo
TRINIDAD
Gulf of Darien
ISTHMUS OF PANAMA
Gulf of Panama
Vol.Tolima
Magdalena R.
LLANOS
Orinoco River
GUIANA
SIERRA PACARAIMA
HIGHLANDS
Guaviare R.
TUMAC-HUMAC MTS.
Mouths of the Amazon River
MARAJO
EQUATOR
Rio Negro
Yapura R.
LLANOS
Vol. Chimborazo
Gulf of Guayaquil
C.Blanco
Parina Pt.
Napo R.
Maranon R.
Amazon R.
SELVAS
Amazon R.
Tapajos R.
Xingu R.
Ucayali R.
Jurua R.
Purus R.
Madeira R.
C. S.Roque
C. Branco
Araguaya R.
Tocantins R.
Francisco R.
Mamore R.
Guapore R.
Mt.Sorata
Mt.Illimani
Lake Titicaca
Sahama Vol.
PLATEAU OF MATTO GROSSO
PLATEAU OF BOLIVIA
SERRA AIMORES
SERRA DO ESPINHACO
SERRA DA MANTIQUEIRA
SERRA DO MAR
C.Frio
Pilcomayo R.
CHACO
GRAN CHACO
Paraguay R.
Parana R.
BRAZILIAN HIGHLANDS
SERRA GERAL
TROPIC OF CAPRICORN
Atacama Desert
Atacama Vol.
Copiapo Vol.
Salado R.
SALINAS
ST.FELIX I.
ST.AMBROSE I.
Uruguay R.
Parana R.
Mt.Aconcagua
MAS A FUERA I.
JUAN FERNANDEZ I.
Plata R.
PAMPAS
Colorado R.
Blanca Bay
Rio Negro
San Matias Gulf
ANDES MOUNTAINS
PACIFIC OCEAN
ATLANTIC OCEAN
PLATEAU OF PATAGONIA
PATAGONIA
CHILOE I.
CHONOS ARCHIPELAGO
Gulf of St George
WELLINGTON ISLANDS
FALKLAND IS.
Strait of Magellan
Strait of Magellan
TIERRA DEL FUEGO
Cape Horn
80°
70°
60°
50°
40°
10°
0°
10°
20°
30°
40°
50°
90°
80° Longitude 70° West 60° from 50° Greenwich 40°
30°
20°
WILLIAMS ENGRAVING CO., N.Y.

FIG. 334.

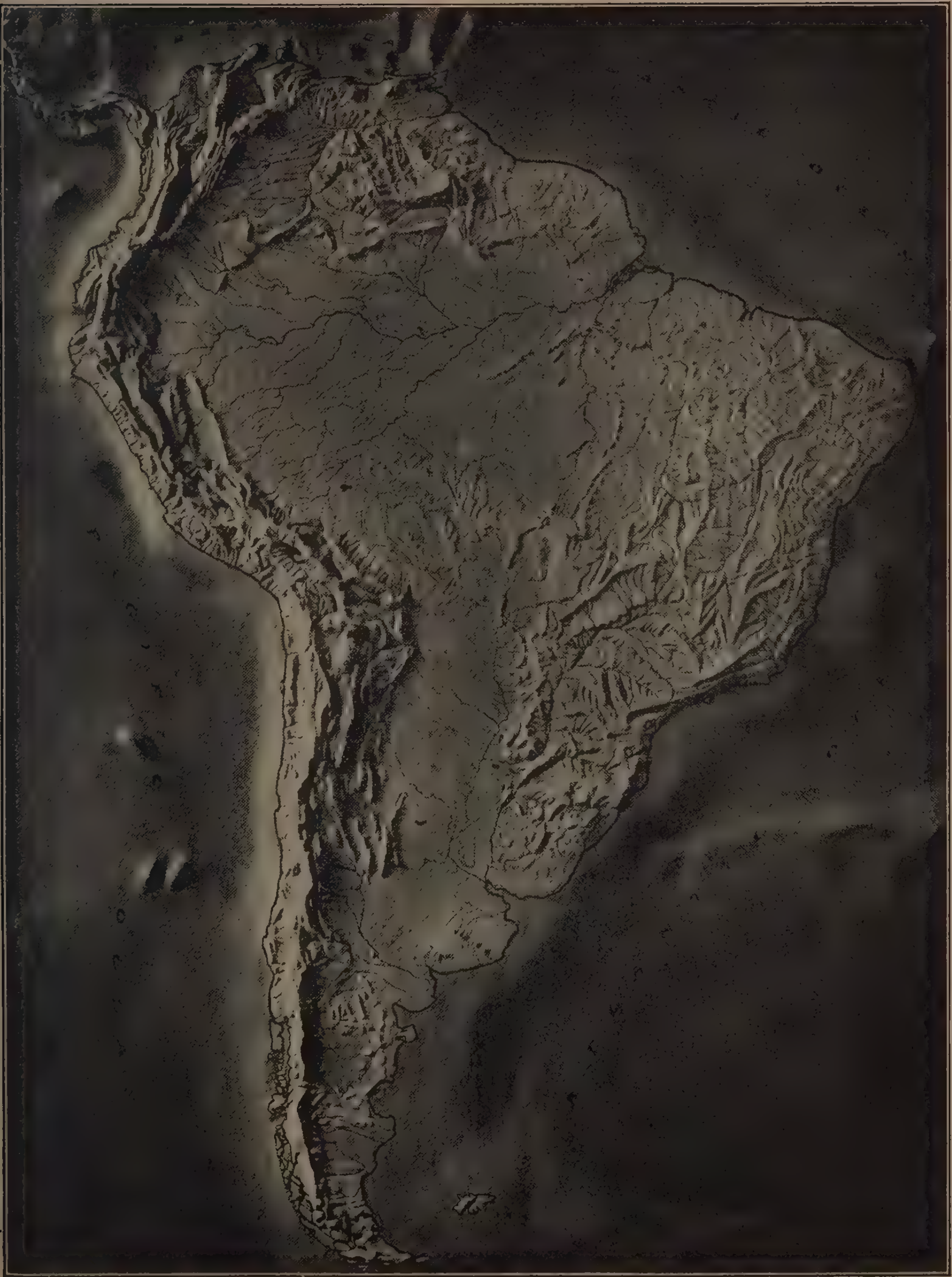


FIG. 335. — Relief map of South America.

other hand, has been rising. This has made the coast line straight, because the raised sea bottom is so level. The western coast of South America is the most regular coast, of long extent, in the world. For a distance of three thousand miles there are very few good natural harbors. What effect must this have upon the development of the continent?

Fig. 336. — A view in the lofty snow-covered Andes.

Climate

1. Temperature

What portion of South America has a tropical climate? How do you know? Where does the Tropic of Capricorn cross the continent? What countries of South America are partly or wholly in the temperate zone? During what months do they have summer? What effect on temperature are their north winds likely to have? What part of South America has a climate much like that of the United States?

2. Rainfall

(1) *The winds*

The winds, together with the highlands, are the key to the rainfall. On the map (Fig. 294) it is seen that the belt of calms extends across the continent in the neighborhood of the equator. North of this belt the northeast trade winds blow (Fig. 294), while south of it is the zone of southeast trade winds. Still farther south are the horse latitudes, and then come the prevailing westerlies (Fig. 293), which blow across the southern end of the continent.

(2) *The rainfall in the tropical zone east of the mountains*

As one would expect, there is heavy rainfall (Fig. 296) in the belt of calms. The northern coast must also receive abundant rains, because the trade winds blow from the ocean and are forced to rise in passing over the slopes. The highlands of eastern Brazil must likewise be well watered by the vapor-laden southeast trades (Fig. 296). The trade winds lose much of their moisture in traveling across the continent, but on approaching the Andes they are forced to a still greater height. Accordingly, the eastern side of this range is wet by frequent rains.

You have learned (p. 214) that the belts of rainfall shift northward and southward, each year, as the season changes (Figs. 294 and 295). Therefore, there is a belt, on each side of the equator, where the land is dry at one time of year and well watered in the opposite season. These belts of grass lands, or savannas (p. 228), lie on both sides of the equatorial forest. They are called *llanos* in the Orinoco Valley, and *campos* in Brazil.

(3) *In the tropical zone west of the mountains*

South of the belt of calms, in Peru and northern Chile (Fig. 296), the western slopes and valleys of the Andes are far too arid for agriculture without irrigation, and some portions are true deserts (Fig. 337). This region is arid because the Andes Mountains prevent the trade winds from reaching it. Here the prevailing winds blow from the south; that is, parallel to the coast. For this reason they have little vapor; and since they are blowing *to-*

ward the equator, and therefore becoming warmer, they do not give up their moisture. Thus there are deserts even on the very coast.

(4) *In the south temperate zone*

Farther south, in Chile, the influence of the prevailing westerlies is felt. In this part of the continent, therefore, it is the *western* side that receives the rain, while the eastern part is dry (p. 212). In rising over the land these west winds, from the ocean, cause abundant rainfall in central and southern Chile; but, being robbed of their vapor as they cross the mountains, they descend as dry winds upon the plains of Argentina. With what portion of the United States may the climate of western Argentina be compared?

From the above we see that, while most of South America is well supplied with rain, two extensive areas, on opposite sides of the Andes, are arid. Locate them (Fig. 299).

Fig. 338. — A view in the dense jungle of South America.

Plant and animal life

1. Plant life

In the warm, rainy belt the great humidity and high temperature favor luxuriant plant life (Fig. 338). So dense are the vast jungles of the Amazon that travel through them is almost impossible (p. 243), and immense areas have never been explored. In the desert of the west coast, on the other hand, plant life is very scanty (Fig. 337). There are some parts — for instance, the Desert of Atacama in northern Chile — where there is almost no life of any kind.

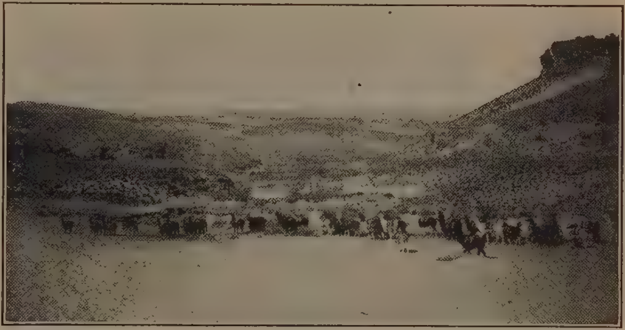


Fig. 337. — A view in the desert of Bolivia in the Andes. The animals are llama.

In the south temperate zone, and on many of the mountain slopes of the torrid zone, where the climate is cool, and the rainfall moderate, the land is forest-covered; but these forests are much more open than the tropical jungle. The extreme southern part of the continent has a climate so cold that the plants become dwarfed, as in northern Canada.

2. Animal life

(1) *In the jungle*

In the tropical forest are many insects and beautiful birds. Among the larger animals may be mentioned the fruit-eating monkey, the fierce jaguar (Fig. 339), which preys upon other

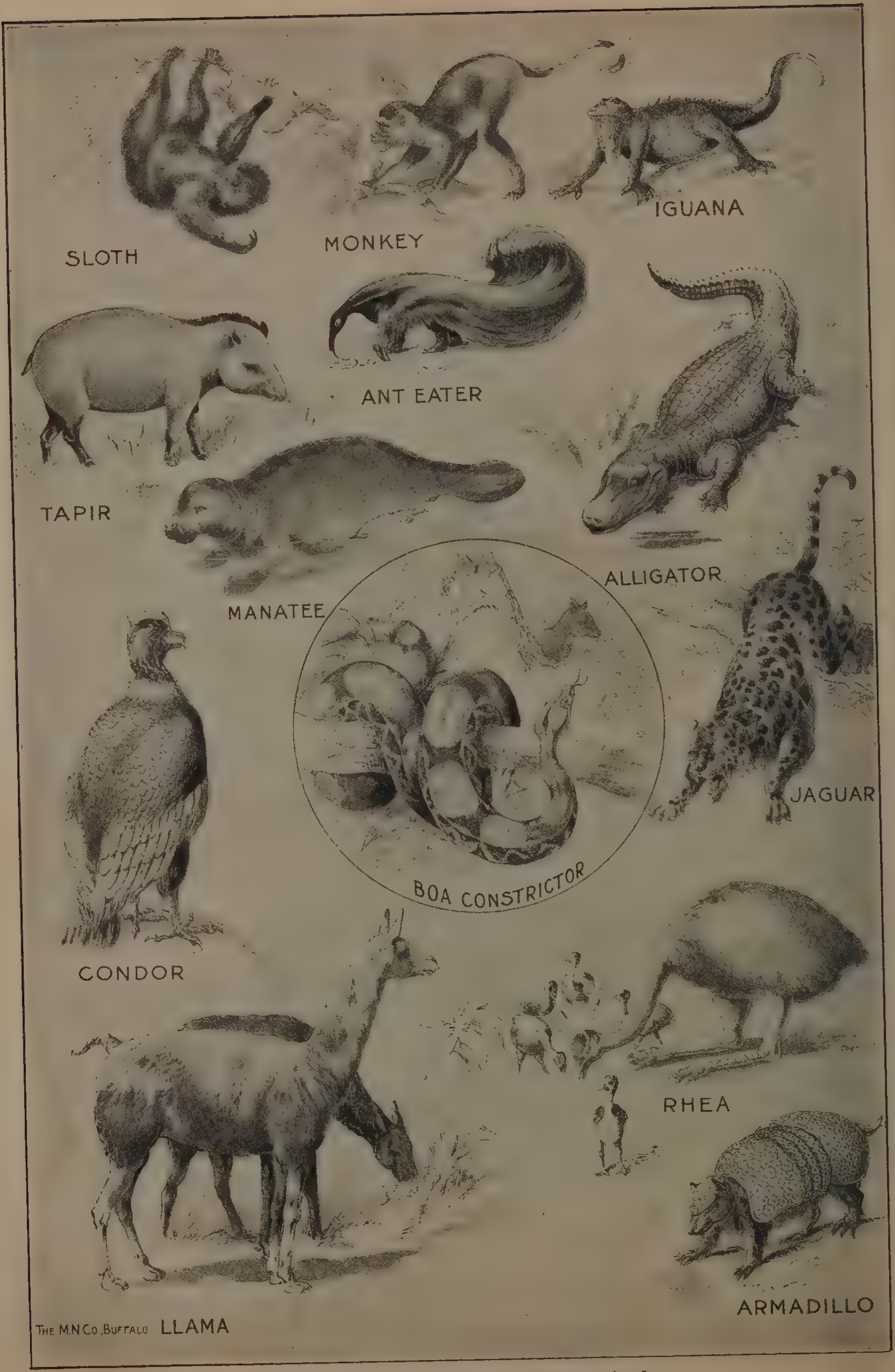


FIG. 339. — Some of the South American animals.

animals, and the sloth (Fig. 339), a creature which sleeps suspended, back downward, from the branches of the trees. There are also many reptiles, including serpents and the iguana, a tree lizard which grows to a length of several feet. Some of the serpents are small and poisonous; others, like the boa constrictor (Fig. 339), are large, and powerful enough to crush a deer in their coils.

The many beautiful butterflies and the ants are especially interesting. The termites, commonly called white ants, live in colonies, and build houses of earth. With so many insects there are, naturally, numerous kinds of insect eaters. One of the most peculiar of these is the ant-eater (Fig. 339). With its long claws it digs the ants from their earthy or woody dwelling places, while its sharp-pointed snout and long tongue aid in finding and devouring its food.

The tapir (Fig. 339), a large animal five or six feet in length, wanders about at night, feeding along the water courses. The armadillo (Fig. 339), a burrowing animal covered with an armor, rolls itself into a ball when attacked by an enemy, thus protecting its soft under parts. In the river waters and swamps are fishes, turtles, and alligators (Fig. 339). The fish and the turtle eggs are among the chief foods of the forest Indians. The manatee (Fig. 339), or sea cow, lives in both fresh and salt water, and ascends the Amazon even as far as Ecuador.

(2) *On the plains and among the mountains*

On the grassy plains herds of deer roam about, and also the rhea (Fig. 339), — often called the American ostrich, — one of the few large running birds. It lives on the open plains, as in Patagonia, where herds of guanaco, a kind of wild llama, are also found.

Among the crags and peaks of the Andes, dwells the condor (Fig. 339), the largest of flying birds, — so large that it kills and carries off small deer. In the mountain valleys live the llama (Fig. 339) and two related species, the vicuna and alpaca, both wild and domesticated (Figs. 337 and 353). Like other mountain dwellers, the llama is so sure-footed on the rocks that it is of great use as a beast of burden; and the cold climate causes it to have a thick coat of wool which is of value to man. Because of its usefulness the llama is sometimes called the American camel.

The inhabitants

1. The natives

(1) *Savages and barbarians*

When South America was discovered by Columbus, it was inhabited only by red men. Many of these were savages; and even to-day some of the forest Indians are savages living almost solely upon fish, game, and the abundant fruits. It is unsafe for white men to go among some of them, and indeed there are forest tribes which are still cannibals.

The red men whom the early explorers found along the eastern coast and some of the larger rivers, were in the lower stages of barbarism like most of the North American Indians. They cultivated the soil in a crude way, and manufactured a few simple implements. Many Indians, in the more remote districts, still live in this primitive fashion, though large numbers have mixed with the white settlers and adopted their customs.

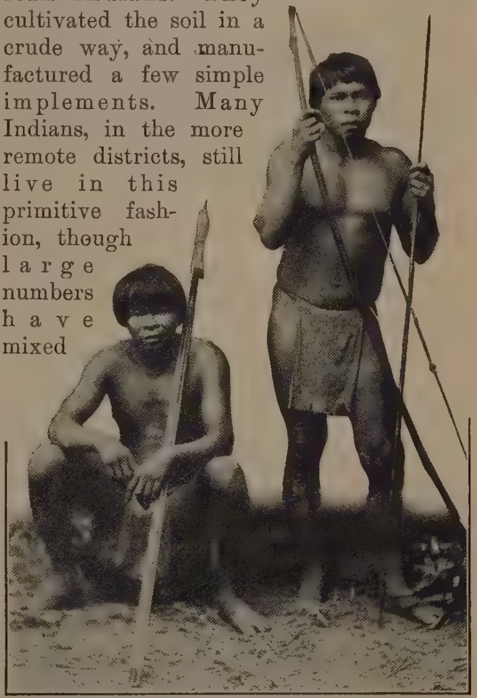


FIG. 340. — Savage Indians who live in the tropical forest of eastern Peru, east of the Andes.

(2) *The Incas*

Among the Andes, especially in Peru, Bolivia, and Ecuador, the Spanish explorers found tribes of Indians, called *Incas*, who had developed far beyond their neighbors. Indeed, like the Pueblo and Aztec Indians of North America (p. 23), they had reached the early stages of civilization. Such advance was favored by the temperate climate of their mountain valley homes, and by the arid

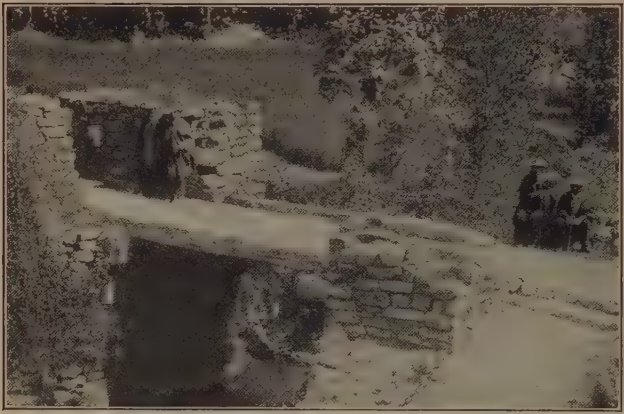


FIG. 341. — A stone bridge in Bolivia, built by the Incas before South America was discovered by white men.

country and the mountain barriers, which served to protect them from the inroads of their more savage neighbors.

By the aid of irrigation the Incas tilled the soil, cultivating the potato, corn, and Peruvian cotton, all of which they had improved from wild plants. They domesticated the llama and alpaca for their wool, and for use as work animals. They organized armies, built roads (Fig. 341), and had a rude postal and express system by swift runners. Although they had not invented writing, they kept records by means of knotted strings. Their empire, which extended for more than two thousand miles along the Andes, and from the Pacific coast to the trackless forests of the Amazon, was governed by a powerful chief whose capital was Cuzco in Peru. The stage of advancement reached by these red men was wonderful.

2. The Spaniards and their influence

The Spaniards, attracted by the discovery of rich deposits of gold and silver, seized almost all of South America, except Brazil, which was settled by the Portuguese. They treated the natives with great cruelty, especially the Incas, whom they robbed of their treasures and reduced to slavery.

As in North America, the Spaniards intermarried freely with the Indians, so that the present inhabitants of South America are, to a large extent, of mixed blood. The introduction of negro slaves has led to a still greater mixture of peoples. Therefore, while there are still pure-blooded Indians and negroes, and also pure-blooded white men, especially Spanish and Portuguese, the greater number of the South Americans are a mixture of two or more of these very different races.

3. Recent immigrants

Of late there have been many immigrants from European countries, especially from Germany and southern Europe. They have gone mainly to southern Brazil, Argentina, and Chile, and have helped greatly in the development of these countries.

Government

Spain maintained her control in South America for fully three hundred years. In the early part of the nineteenth century, however, the

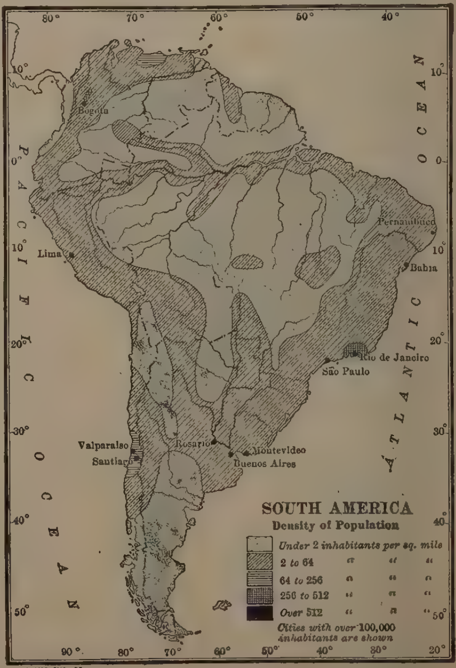


FIG. 342.

colonies became so dissatisfied with Spanish rule that they fought for independence. They were successful and formed independent republics, modeled after the United States. Brazil also became independent of Portugal, and, after being for a long time ruled by an emperor, established a republican form of government in 1889. Every country of South America is now an independent republic except Guiana, which is divided among three European nations, as shown on the map.

II. Brazil

Its extent

This is the largest country in South America. It is even larger than the United States without Alaska, and nearly as large as the whole of Europe. While extending north of the equator on one side, it reaches into the south temperate zone on the other. How many degrees of latitude does it include?

Its climate

Since so large a part of Brazil is on the eastern slope of the continent, in the torrid zone, its climate is not only warm, but moist. Why the latter (Fig. 296)?

Its drainage

Eastern Brazil is a highland region. Numerous streams drain this upland in various directions. Point out some of them (Fig. 334). What is the name of the largest river not tributary to the Amazon?

The northern third of Brazil is mainly a vast level plain, drained by the Amazon River. The rainfall in the Amazon Valley is so heavy, and the slope of the land so gentle, that the river and its larger tributaries are swollen to great breadth. At times of flood these rivers overflow the surrounding country and change it to an immense swamp crossed by many channels. In some places the Amazon is several miles wide, and resembles a lake rather than a river.

Navigation on the rivers

The Amazon is navigable for steamboats nearly to the base of the Andes, a distance of twenty-two hundred miles from the seacoast. Some of the tributaries also are navigable. Along this water way there are a few small settlements, such as MAÑAOS, which are reached by ocean steamers; but away from the river there is nothing but an almost unknown wilderness.

The tropical forest

1. Its appearance

The Amazon forest is a good type of the tropical forest, where plants, encouraged by the heat and dampness, grow luxuriantly in the rich soil. Not only is the rainfall heavy, but evaporation is checked by the dense vegetation, so that the forest reeks with moisture. Therefore, at night, when the temperature falls, such heavy dews collect that the plants are wet, as by a rain.

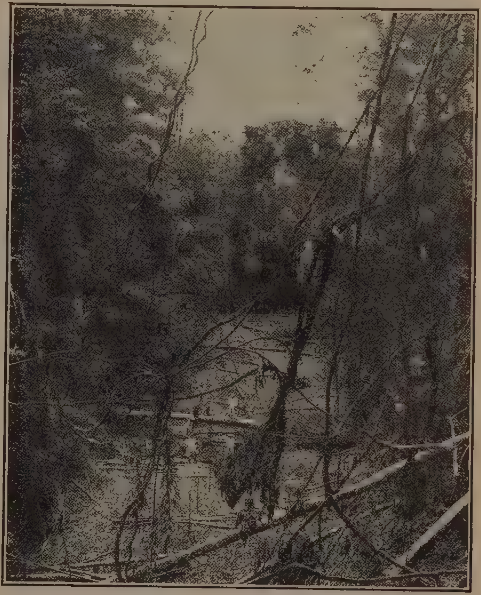
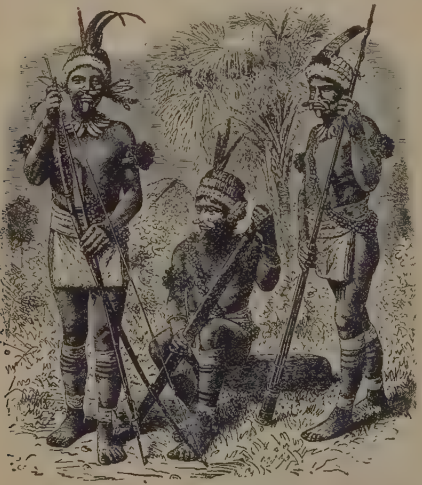


FIG. 343.—Cutting a road in the dense tropical forest of the Amazon Valley. Notice the wavy vines hanging from the trees.

In these woods there is an occasional giant tree reaching to a height of from one hundred and eighty to two hundred feet, and with a circumference of from twenty to forty feet. The lower limbs may be as much as a hundred feet from the ground. Between these giant trees are smaller ones struggling to rise out of the somber shade into the sunlight. There are also many shrubs, bushes, ferns, and vines, the latter twining about the tree trunks or hanging from the lower limbs (Fig. 343).

The woods present much the same appearance throughout the year. There is no time when all the trees send forth their leaves and blossoms; nor is there a time when all the leaves change color and fall to the ground. Some of the trees blossom throughout the year; others have their blossoms at regular seasons; thus flowers and fruits may be seen at all times of the year.

In such a forest there is dense gloom and silence, broken now and then by the crash of a falling tree, or the sorrowful notes of birds, or the howling of monkeys, or perchance the shrill scream of an animal which has fallen a prey to the boa.



Ratzel's History of Mankind.

Fig. 344. — Savage Indians who live in the interior of Brazil, far away from the region where white men live.

2. Its products
(1) *Fruits, nuts, dyewoods, and vanilla*

Some of the trees of the forest produce fruits and nuts, others valuable timber or dyewoods. In fact, the word *Brazil* comes from the name of a dyewood found in the Amazon forests. Another valuable plant is the vanilla, whose beans are of value in making perfumes and flavoring extracts. Many of the Indians near the rivers make long journeys into the forest to collect the products, both for their own use and for shipment down the Amazon.

(2) ***Mandioca and yerba-mate***

The Indians still cultivate the *mandioca*, which was one of their principal foods when white men appeared. The root of this plant is somewhat like a long sweet potato, and a dish of dry meal, or *farina*, made from it is commonly seen on Brazilian tables. To these people mandioca is, in a measure, what wheat is to those who live in temperate climates. It is from this plant that tapioca is made. The leaves of a tropical plant called *yerba-mate*, or Paraguay tea, are also obtained in the Brazilian forest. Brazil produces far more of this than Paraguay.

(3) ***Rubber***

The natives are also engaged in obtaining *rubber*, a product of great importance because of its many uses. When gathering rubber, the natives encamp in the forest in lightly built huts from which paths lead through the dense undergrowth to the rubber trees. Holes are made in the trees, so that the sap oozes forth, when it is collected in bamboo dishes. It is then smoked and dried before being shipped down the river to PARA. Find this city on the map (Fig. 333).

Besides the trees in the forest, there are many rubber plantations in which the rubber tree is carefully planted and cultivated. Rubber ranks second among the exports from Brazil, and one of the principal markets for it is the United States. What are some of its important uses?

Agriculture
1. Coffee

The coffee tree is a native of Abyssinia in Africa. It was introduced into Brazil long ago, and has proved so valuable that Brazil now produces more than one half of all the coffee used in the world. It is cultivated all the way from southern Brazil to the Amazon, and there are fully five hundred million coffee trees in that country. They grow best at altitudes of from fifteen hundred to forty-five hundred feet, and are therefore very common on the highlands of eastern Brazil. Each tree produces from thirty to forty pounds of coffee a year. Between April and September the berries are picked, dried in the sun, and hulled by machinery.

After being sorted in the cities, the coffee is shipped in bags. Formerly most of the Brazilian coffee left the port of RIO DE JANEIRO; but now more than half of it is sent from SANTOS. Coffee is the principal export of Brazil, and much of it comes to the United States.

2. Other agricultural products

Cotton, sugar, tobacco, fruit, and corn are also raised extensively on the highlands of Brazil. Much cocoa is cultivated in the tropical section, and in the extreme south many cattle are raised.

Mining and manufacturing

The rocks of the highlands produce some valuable minerals, especially gold and diamonds. Indeed, before diamonds were discovered in South Africa, Brazil was the principal diamond-producing country in the world. Both coal and iron are also found, though they are not yet extensively mined.

Manufacturing has begun to be important in Brazil, which is one of the most progressive of the South American countries. Cotton manufacturing is rapidly increasing, and there are also woolen mills, flour mills, and other manufacturing plants, chiefly in southern Brazil. Why should this be the most progressive part of the country?

Principal cities

The capital and largest city of the Republic is RIO DE JANEIRO (Fig. 345), a city with a population of a million people, and the second in size in South America. It is situated upon a fine harbor and is surrounded by an excellent farming country dotted with coffee plantations.

Several other Brazilian cities are seaports, connected with the interior by short railway lines which bring the coffee and other products for shipment. The most important are SÃO PAULO, BAHIA, and PERNAMBUCO, the chief port for the export of sugar and cotton, and SANTOS, the seaport of São Paulo.

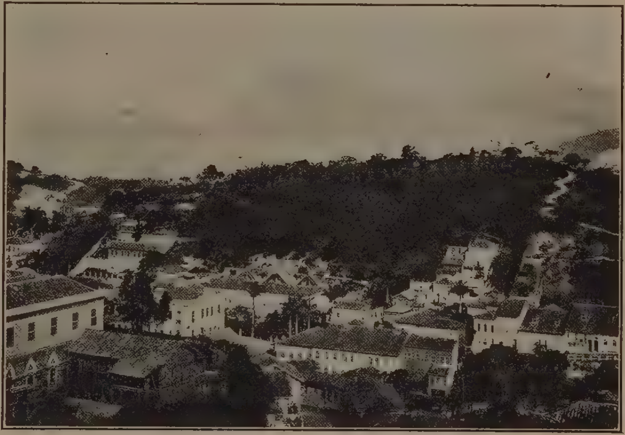


FIG. 345. — A view of part of Rio de Janeiro.

III. ARGENTINA

Why the most progressive country in South America

This is the most advanced of South American countries. One reason for this is that Argentina extends from just within the torrid zone to the extreme southern end of South America. Thus the country is, for the most part, within the temperate zone, which has the climate most favorable to the development of energetic people.

Besides this, there are many different kinds of climate, arid in one part, rainy in another; tropical here, warm temperate there, and cool temperate elsewhere. Such a variety of climate makes it possible to raise a great variety of products.

A third reason for rapid progress is the fact that much of the country consists of *pampas* (Fig. 346). These open, treeless plains have made it easy for settlers to move about and to carry on the industries of farming and ranching. The ease of settlement on these open plains contrasts strikingly with the unfavorable conditions in the dense tropical forest of the Amazon Valley, but may be compared with the conditions on the plains and prairies of the United States.

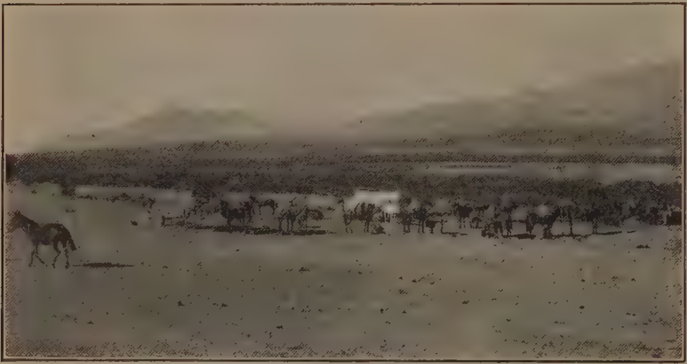


Fig. 346. — A view on a cattle ranch in the pampas of Argentina.

There are, however, extensive forests in the north, and lofty mountains in the west, and because of these the industries of the country are even more varied.

Such favorable conditions have served to attract many immigrants from Europe, and there is, therefore, a larger proportion of pure-blooded whites here than in other countries of South America. Largely for this reason the government of Argentina is better than that in most South American countries. That, alone, has had much to do with the progress of Argentina.

Agriculture
1. Farming

In many parts of Argentina the climate and soil are favorable to agriculture. In the warm northern portion sugar cane, coffee, and tobacco are produced; in the more temperate part, wherever the rainfall is sufficient, grains and alfalfa are raised. There is also much fruit raising, especially grapes, from which wine and raisins are made.

Wheat is the most important agricultural product, for the humid part of the Argentine plains is one of the greatest wheat-producing sections of the world. The climate is favorable, the soil fertile, and the land level or gently rolling, as in our Red River Valley.

2. Ranching

The extreme south is too cold for farming, but sheep raising is carried on even in Patagonia and on the stormy islands beyond the Straits of Magellan. The arid, open plains are so well adapted to ranching, that there are many millions of sheep and cattle in this country.

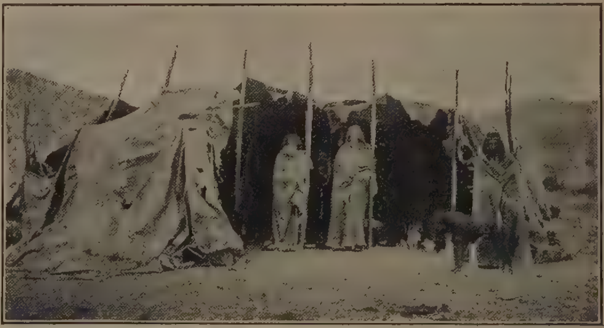


Fig. 347. — Indians living in the cold southern region on the Straits of Magellan.

Lumbering and mining

There is some lumbering and mining in the mountainous portion. From the words *Argentina* and *Plata*, both of which mean silver, one might conclude that this is a great silver-producing region. This is not so, however, for those names are due merely to the fact that the natives wore silver ornaments. Argentina is not important as a mineral-producing region, though some gold, silver, copper, iron, coal, and petroleum are found.

Manufacturing and commerce

In the large cities there are many industries, largely connected with the raw products of the country. The leading kinds are dairying and the manufacture of wool, flour, sugar, wine, leather, and cotton. A large portion of the raw products, however, is sent abroad, particularly wool, hides, wheat, corn, and meat. Machinery and many other manufactured articles must still be imported.

In a country so progressive as this, it is natural that there should be means of ready transportation. The broad Parana River, which empties into the Plata Estuary, forms an important water way to the interior; and railways cross the well-settled portions of the country, connecting all the important cities. In fact, there are more railways here than in any other South American country. In resources, industries, government, and education, Argentina, of all the South American countries, most closely resembles the United States.

Principal cities

By far the most important city is Buenos Aires. With over a million inhabitants, it is the largest city in South America, and one of the great cities of the world. It is growing rapidly and has much manufacturing and commerce.

Just below Buenos Aires, on the Plata Estuary, is the seaport of La Plata; and upstream, on the Parana River, is the rapidly growing city of Rosario, which is an important railway center as well as a river port. In the interior are a number of towns and cities, among which Cordoba is one of the largest.

IV. Uruguay and Paraguay

Uruguay

Like so much of Argentina, this is a region of plains, and since a large part of the country is well watered, it is suited to the production of the same crops as northern Argentina. But there has been much less development in Uruguay than in Argentina. One reason is that it has been very badly governed, for a few men have often controlled the army and made and unmade presidents almost at will.

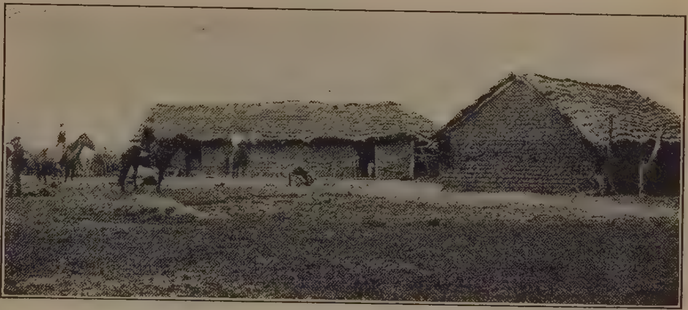


Fig. 348. — A ranch house on a cattle ranch in Uruguay.

In late years there has been great improvement, and agriculture is being extended, — such crops as wheat and other grains, tobacco, and fruits being important products. Cattle and sheep, are, however, of even greater importance.

The principal manufactured products and exports are those connected with cattle and sheep; namely, dried beef, corned beef, ox tongues, hides, tallow, horns, and wool. The capital and largest city is the seaport, Montevideo, on the Plata Estuary.

Paraguay

This little country, like Bolivia, is without a seacoast, though it is connected with the sea by the Parana River. It is a region of hills and plains, partly covered with forests, but with much pasture land upon which large herds of cattle feed. The climate is hot and in many parts dry, with most of the hot winds from the north.

The agricultural products, besides cattle, are those of the warm temperate and tropical zones. These include tobacco, rice, sugar cane, and oranges. Rubber, dyewoods, and valuable timber are obtained from the forests. Another product is *yerba-mate*, or *Paraguay tea*. Although not used so extensively as our tea, which comes mainly from Asia, the Paraguay tea is very popular in South America, where its use was learned from the red men.

The capital, Asuncion, is connected with Argentina, Uruguay, and the sea coast by rail.

V. The Guianas and Venezuela

The Guianas

North of Brazil are three small countries, the only portions of the South American continent now under control of European nations. They belong to Great Britain, Holland, and France, respectively, and are known as *British Guiana*, *Dutch Guiana* or *Surinam*, and *French Guiana*. Find the capital of each.

In these countries a large part of the surface is still a forest wilderness, inhabited chiefly by Indians. This tropical forest, like that of the Amazon, which it closely resembles, supplies rubber and valuable timber; but its resources are only slightly developed. Near the coast there is a strip of cultivated land on which sugar cane, bananas, cotton, and a few other products are raised. Of late, especially in Dutch Guiana, attention has been turned to the production of cocoa and coffee. Some gold is found in each of the Guianas. The Guianas have but one short railway, and in most sections there are almost no roads. There are scarcely any exports except sugar, molasses, and rum — all made from sugar cane.

Venezuela

1. Character of country, and products

This name, which means "little Venice," was given in 1499 because the explorers found an Indian village built on piles, or posts, in the water along the shore of Lake Maracaibo.

Venezuela includes one of the spurs of the Andes, and also a portion of the Guiana highland; but a large part of the country is occupied by the broad plains of the Orinoco Valley. Some of these plains, the treeless *llanos* (p. 228), are the seat of extensive cattle raising, as is the case on the pampas of Argentina. There is some farming. Hardy crops, like potatoes, beans, and barley, are raised even at altitudes of eight thousand feet; but below five thousand feet are found such semitropical and tropical products as sugar cane, bananas, cocoa, and coffee. Coffee is the chief export; in fact, Venezuela is one of the leading coffee-producing sections of South America.

In parts of Venezuela there are vast forests which produce valuable dyewoods and rubber; and among the mountains are rich mineral deposits, especially gold.

2. Chief city

The capital, Caracas, five or six miles from the sea, is situated upon a plateau, over three thousand feet above sea level. It is connected with its seaports by a short railway.

In 1812 Caracas was visited by one of the most terrible earthquakes ever recorded. It being Ascension Day, a great part of the population, which is Catholic, was at church. The first shock caused the bell to toll; but after all danger was thought to be past, there came a terrible noise from underground, resembling the rolling of thunder, though louder and longer. Then followed a shaking of the earth, so tremendous that churches and houses were overthrown, and the inhabitants were buried beneath their ruins. On that day fully twelve thousand persons perished.

VI. Tropical Andean Countries

Resemblances to one another

1. In surface

These countries — Colombia, Ecuador, Peru, and Bolivia — are all crossed by the lofty Andes, and are therefore very mountainous. Each of them extends eastward, beyond the mountains, to the plains of the upper Amazon and Orinoco valleys. The headwaters of the Amazon and its tributaries, in the region of the equator, have never been fully explored, and for that reason the exact boundaries of these countries of this section have been in dispute.

2. In variety of climate and of farm products

In such a mountainous country, there is, of course, great variety of climate. Tropical heat prevails throughout the lowlands (Fig. 349); but on the mountain slopes there are temperate and even frigid climates.

The farm products vary accordingly. Up to an elevation of three thousand to four thousand feet, bananas, sugar cane, cocoa, and other plants of hot climates flourish. Above this, to an elevation of six or seven thousand feet, tobacco, corn, and coffee are cultivated. From this height up to about ten thousand feet, wheat and our Northern vegetables and fruits do well; but above ten thousand feet the bleak mountain peaks are too cold for farming.

There is a great difference in the rainfall, as well as in temperature. Near the equator the rainfall is heavy; but in southern Peru, which lies in the belt of the southeast trade winds (p. 212), the climate is arid. On this account the tropical forest gradually dwindles toward the south, being replaced first by arid plains, and then by deserts.

3. In abundance of minerals

The fact that this section is so mountainous explains its importance as a mineral region. Gold and silver ores, and other minerals as well, are found from the northern to the southern limit of the Andes, and this is one of the great mineral-producing regions of the world.

4. In location of chief cities

None of the capitals of the Andean countries are on the coast, and several are in the interior at a considerable elevation above sea level. Find examples. In choosing such sites the inhabitants have had the example set them both by their Spanish ancestors and by the Incas; for Cuzco, the capital of the Incas, and Madrid, the Spanish capital, are both at a considerable elevation above sea level, and many miles from the coast. The principal objects in the selection of such sites were to be near the mines, to secure a cooler and more healthful climate, and to obtain protection from attack by sea. Doubtless the absence of good harbors (p. 238) was another reason why these capitals were not located on the coast.

5. Government

It has been very difficult to carry on a republican government in these countries, where a large part of the population can neither read nor write, and where there are so many Indians and half-breeds. In each of them ambitious leaders, usually generals in the army, have again and again overturned the government. This has greatly interfered with the development of industry and commerce; for neither life nor property has been safe. It has also prevented settlers from coming. Of late, however, there has been great improvement.

FIG. 349. — Tropical foliage on the lowlands of Ecuador near the coast.

Colombia, named after Columbus, has seacoast on both oceans. The western part

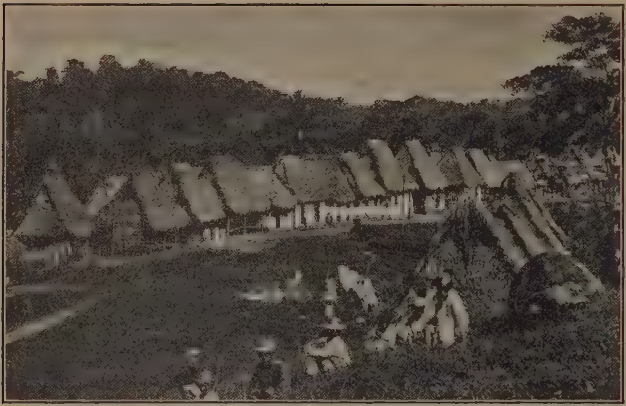


FIG. 350. — A village in Panama.

Colombia

is very mountainous, for several of the Andean ranges terminate there. Much mineral is found here, gold and silver being most important, though emeralds of excellent grade are also obtained.

In the eastern portion, on the other hand, are treeless llanos on which large numbers of cattle are raised, as in Venezuela. Coffee is the principal farm product and the chief export; but sugar cane, tobacco, and cocoa are also produced. On the mountain slopes the grains, fruits, and vegetables of temperate climates are grown.

BOGOTA, the capital and largest city, is situated far in the interior, at an elevation of about a mile and a half above sea level. It has an agreeable climate, even though within the tropical zone.

Panama

The small republic of Panama was formerly a part of Colombia, but it revolted and became an independent country a few years ago. What have you learned about it (p. 177)? What can you tell about the Panama Canal zone (p. 154)?

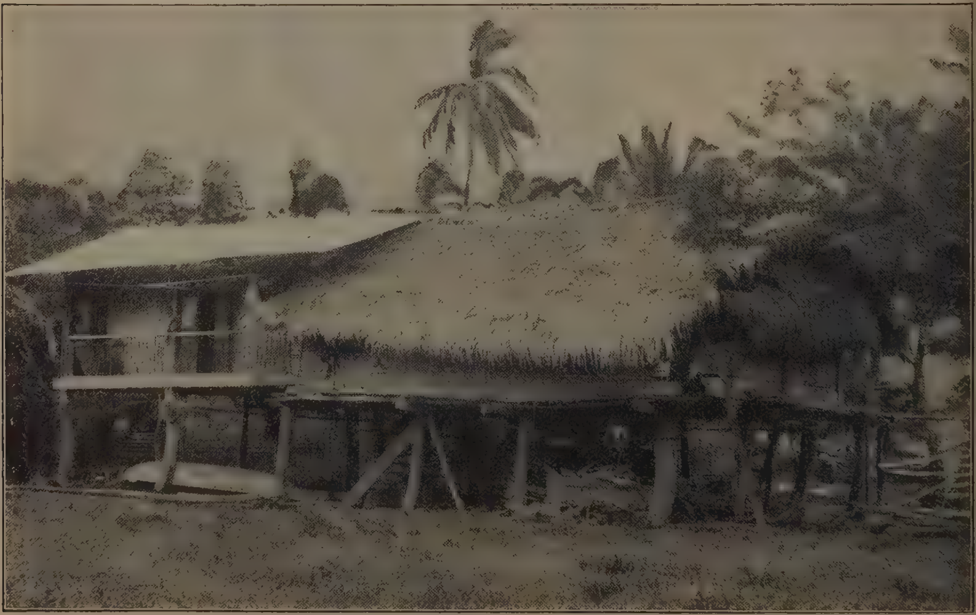


FIG. 351. — A house in Ecuador raised above the ground because of the dampness.

Ecuador

Why should Ecuador, the Spanish word for *equator*, be given to this country? In the Andes of Ecuador there are many volcanoes, including Cotopaxi, the loftiest active volcano in the world, and Chimborazo, which is still higher, though no longer active. Describe the climate (p. 212).

The principal occupations are farming and cattle raising. The chief farm products are wheat and barley on the highlands, and coffee, sugar cane, and *cocoa* on the lowlands. Cocoa is the most important product of Ecuador, and fully one sixth of all that is produced in the world comes from here.

The cocoa tree, which grows in the shade of the larger forest trees, has small pink and yellow blossoms which spring directly from the main trunk and branches. Its leaves are always green and it blossoms throughout the year. From each blossom there develops a golden-colored pod, several inches in length, inclosing a number of seeds, or beans, which are about the size of a large almond. After being washed, dried, and roasted, the beans are ready to be made into cocoa and chocolate. What are some of their uses? By what routes might they be shipped from Guayaquil to New York?

Another product of Ecuador, and of some other South American countries, is *sarsaparilla*. The rubber industry is also well developed.

There is an almost total absence of roads in this country, making the transportation of heavy machinery very difficult. This fact interferes greatly with mining among the mountains. Therefore, although there are known to be many minerals, there is little mining except of the richest gold deposits. There is almost no manufacturing in the country.

GUAYAQUIL, the seaport and the westernmost of the large cities of South America, is first in size. It is in W. Long. 80°. Does it lie east or west of Washington, D.C.? QUITO, the capital and the second city in size, is situated among the mountains of the interior at an elevation of about nine thousand feet.

Peru

1. Climate

There is abundant rainfall in northern Peru and on the eastern side of the Andes; but in southern Peru the climate is arid and there are deserts (Fig. 296). Recall the cause of this arid climate (p. 212). So little rain falls in southwestern Peru that in some parts, even close by the sea, there is an average of but one shower in seven years.

2. Mining

Peru was one of the most valuable sources of gold and silver for the Spanish conquerors. The Incas, who dwelt there, had collected gold for ornaments, and this the Spaniards seized. Then, opening mines, they forced the Indians to work in them as slaves. Since that time vast quantities of gold and silver have been obtained in this country; and valuable deposits of coal, petroleum, and copper have also been found.

FIG. 352. — An Inca Indian of Peru.

3. Agriculture

There is much agriculture in Peru, the principal crops being corn, wheat, and potatoes among the mountains, and sugar cane, cotton, tobacco, cocoa, and coffee in the lower and warmer sections. Even in the desert portion there is some farming by irrigation, as in southern California. Large numbers of sheep and cattle are raised, and also the llama and alpaca for their wool (Fig. 353).

An unusual product is *coca*, from which *cocaine* is made; and another is *cinchona*, or *Peruvian bark*, from which *quinine* is made. These plants were cultivated by

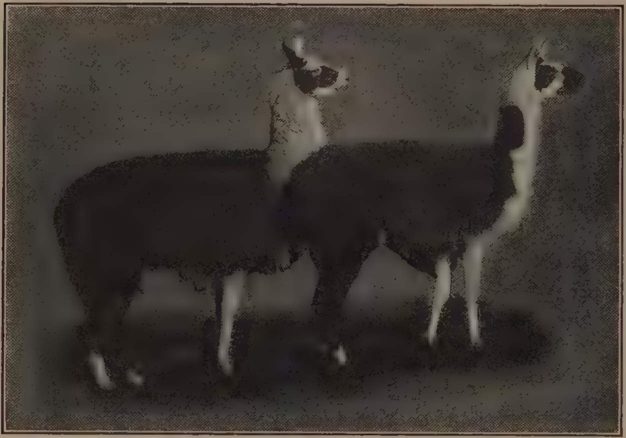


Fig. 353. — The South American llama.

the Incas before the coming of the Spaniards.

4. Manufacturing and transportation

There is some manufacturing in Peru, especially of sugar and cotton goods. One great difficulty, however, has been that of transportation. The rugged Andes extend the entire length of the country, separating the Pacific coast from the broad, forest-covered plains of eastern Peru. To overcome this difficulty, the Peruvians have built several railways, one of which deserves special mention. Beginning at Callao this line passes through Lima; then it climbs the mountains, crossing deep gorges, by means of high trestles, winding about on the very edge of precipices, tunneling through the mountain rock, and finally crossing the western range of the Andes at an elevation of over fifteen thousand feet.

5. Chief cities

Lima, the capital (Fig. 354), founded by the Spanish conquerors in 1535, is situated at the base of the Andes. Callao, the seaport of Lima, is about seven miles from the capital. Its harbor is but little more than an open roadstead partly protected by an island on the southwest side. However, since the winds and ocean swells are *from the south*, while the coast is seldom visited by storms, this slight protection is sufficient.

Arequipa, at an elevation of seven thousand feet, is separated from the sea by sixty miles of desert. Cuzco is on an interior table-land, at an elevation of over eleven thousand feet. The ruins of the Inca citadels and "palaces" are still to be seen, and many pure-blooded and half-breed Incas still dwell in and near this ancient capital.

Bolivia

This country, named after General Bolivar, the great South American leader in the revolt against Spain, was robbed of its seacoast by Chile. Its surface is mountainous, with broad and very high plateaus between the mountain ranges. In one of these valleys lies Lake Titicaca (Fig. 355), partly in Peru and partly in Bolivia. This lake, the greatest in South America, is about a third the size of Lake Erie. It is the most elevated great lake in the world, lying over twelve thousand feet above the sea.

The Incas occupied this region also, and mined much gold. Besides gold, the Spanish discovered veins of copper, tin, and sil-

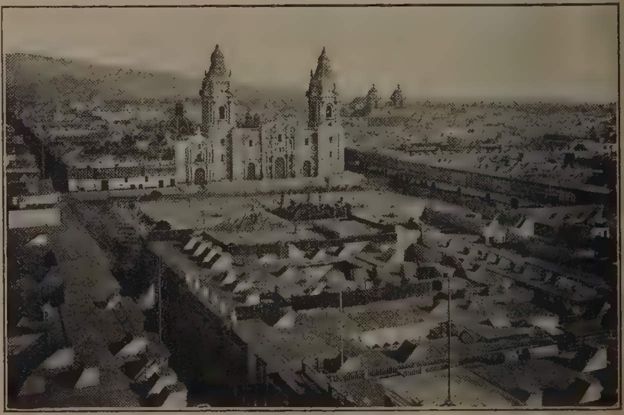


Fig. 354. — A view of Lima, the capital of Peru.

ver, so that mining has been one of the most important industries of the country. It is said that over three billion dollars' worth of silver has been mined in Bolivia since the Spaniards first visited the country.

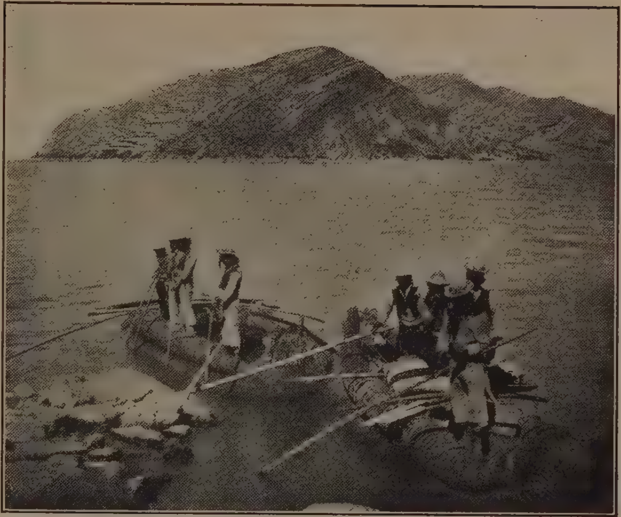


FIG. 355. — Indians in their grass boats on Lake Titicaca.

Both the mining and the work of obtaining the metals from the ore are done very crudely. For example, instead of using costly machines for crushing the ore, as in the United States, one method is to roll bowlders around on the ore. Since there are very few railways, goods are carried for the most part by trains of pack mules, donkeys, alpacas, or llamas (Fig. 337). The llama here, as in Peru, is of great value to the inhabitants, not merely as a beast of burden, but also as a source of wool for clothing.

Like eastern Peru and the Amazon Valley of Brazil, much of eastern Bolivia is an almost unknown forest wilderness. In the mountain valleys, however, there are settlements where agriculture is

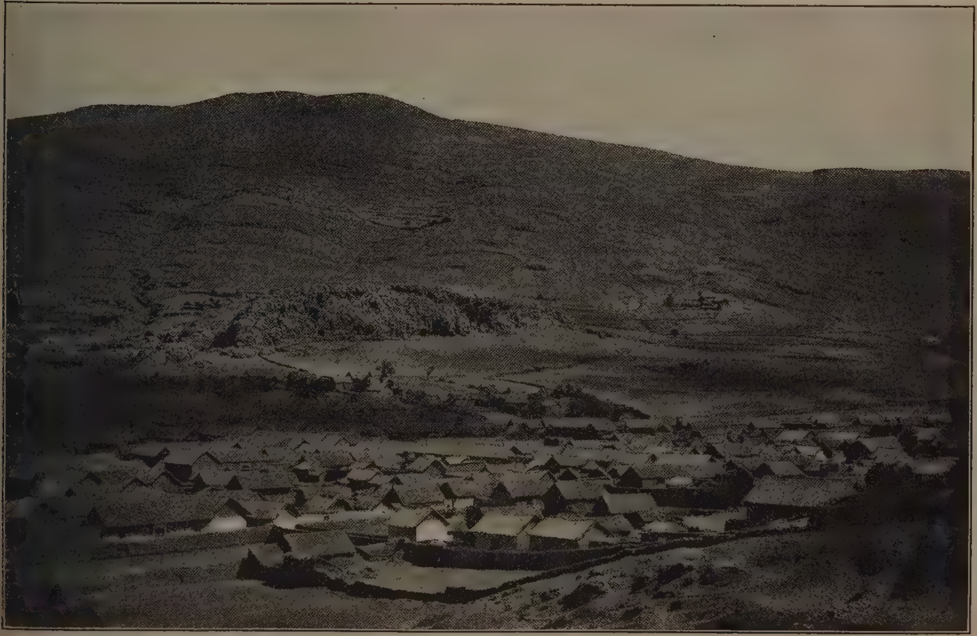


FIG. 356. — La Paz, the largest city of Bolivia, situated in an arid valley among the lofty Andes.

carried on, with products similar to those of Peru. Name them. Most of these are consumed at home, though some coffee is exported.

A railway line connects western Bolivia with the sea; but there is great need of others. Another need is the improvement of the water ways to permit river transportation to the Atlantic. Through what rivers could boats pass to the sea?

Find the capital of Bolivia. La Paz (Fig. 356), the largest city, has more than three times as many inhabitants as the capital.

VII. Chile

Surface features

The eastern boundary of Chile is the divide between the Atlantic and Pacific drainage; and since this runs along the Andes, the country is very mountainous, and narrow in an east and west direction. Measure its length; also its width. Except in the south, the coast line is regular, like that of the rest of South America.

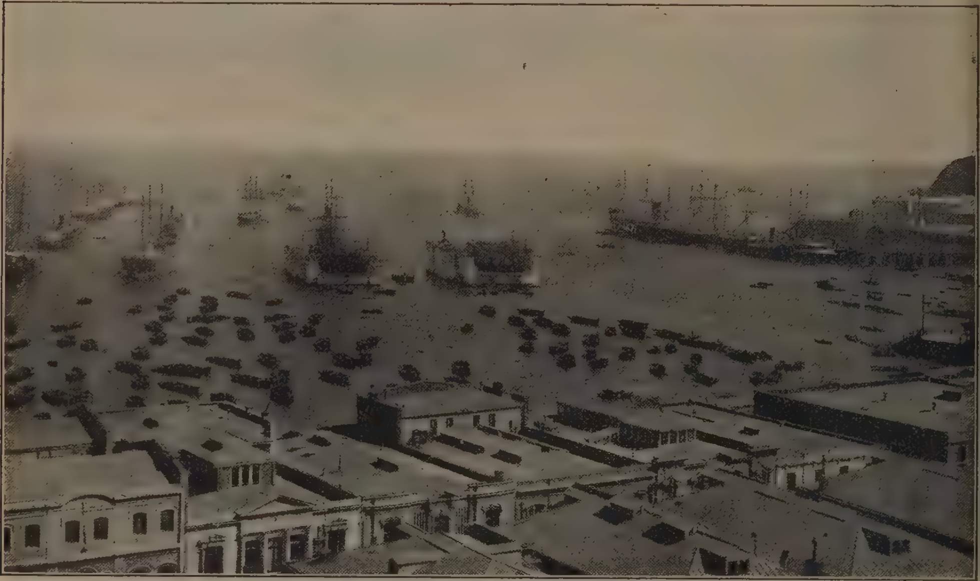


Fig. 357. — The shipping in Valparaiso harbor.

Climate

The climate varies more than that of any other South American country. The northern part is within the torrid zone, while the southern end reaches far into the bleak south temperate zone; and on the mountain slopes there is every climate, from torrid to frigid. The very name, Chile, is derived from an Indian word for snow.

There is also great difference in rainfall; for northern Chile is arid, and in some portions an absolute desert; while central and southern Chile reach into the rainy belt of prevailing westerlies (p. 212). The best-developed section of the country lies in the middle part, between the hot, arid north and the bleak, rainy south.

Mining

There is much mineral wealth, including gold, silver, coal, and copper. Of these copper is one of the most valuable minerals, and Chile, like the United States, is one of the great copper-producing countries of the world. Even more important than the copper are the beds of nitrate of soda, which yield many million dollars' worth of nitrate every year. This substance is one of the chief exports.

The nitrate beds lie in the midst of the Desert of Atacama, in which rain seldom falls. The substance occurs in layers from a few inches to one or two feet in thickness, over an area thirty or forty miles in breadth. After being dug out, the pure nitrate is dissolved and separated from its impurities, and then sold. Its chief use is as a fertilizer, for which purpose large quantities are shipped from the port of IQUIQUE.

Agriculture

Agriculture is extensively carried on in Chile, especially in the rainy middle portion, as in many parts of the United States. The principal crops are the various grains, tobacco, fruits, and vegetables. More wheat and barley are produced than are needed at home, so that Chile helps to supply other nations with these grains. Large herds of cattle are reared; and sheep raising is one of the chief industries in southern Chile. Hides, leather, and wool are exported.

Manufacturing

There is more manufacturing than in most South American countries, the principal kinds being flour milling, cheese making, tanning, and shoemaking. Manufacturing is rapidly increasing, but, as in other South American countries, it is still necessary to import from Europe and the United States much of the machinery and other manufactured articles used.

Progress of the country

Chile is one of the most progressive nations in South America. Its government is good, and its industries are well developed. This progress is doubtless in large part due to the temperate climate, which requires energy on the part of its inhabitants, and invites settlers from the temperate climate of Europe. It is interesting to note that the two most advanced nations of South America lie side by side in the temperate zone, while the next most progressive country, Brazil, is partly in that zone.

Chief cities

The principal cities of Chile are SANTIAGO, the capital and largest city, situated inland, and VALPARAISO, its seaport (Fig. 357). The harbor of Valparaiso, like that of Callao (p. 252), is open to the north; but the wind seldom blows from that quarter.

VIII. ISLANDS NEAR THE CONTINENT

On the north side

Just off the coast of Venezuela, opposite the mouth of the Orinoco, is the low island of *Trinidad*, a British possession. This island is especially noted for its pitch lake, from which asphaltum is obtained for use in making asphalt pavements. The asphaltum oozes slowly from the ground; and, as it is dug out, more takes its place, showing that there is a very large supply beneath the surface.

On the southeast

Just east of the southern tip of South America are the *Falkland Islands*, which belong to Great Britain. Still farther east are the islands of *South Georgia*, also British. They are cold, bleak lands, with no permanent inhabitants. Yet they are no nearer the south frigid zone than parts of Great Britain are to the north frigid zone. This difference in climate is due to the fact that Great Britain is affected by a warm ocean current, while South Georgia is swept by cold currents from the Antarctic.

On the west

West of Chile, and belonging to that country, is the island of *Juan Fernandez*. This is the island where Selkirk was wrecked, and by some is thought to be the island home of Robinson Crusoe. It seems quite certain, however, that Defoe described Tobago, just north of Trinidad, instead of Juan Fernandez.

The *Galapagos Islands*, about six hundred miles west of Ecuador, on the equator, are a group of small volcanic islands owned by Ecuador. They are too far from the continent to show on our map (see Fig. 2).

Review Questions

1. What striking resemblances in surface features are there between North and South America? 2. What differences? 3. Show how the temperature varies from place to place. 4. The rainfall. 5. Describe the plant and animal life. 6. What can you tell about the native inhabitants? 7. The Spaniards and recent immigrants? 8. What can you tell about the government? 9. Compare Brazil with the United States in area. 10. What about its climate and drainage? 11. Navigation on its rivers? 12. Describe the tropical forest. 13. What valuable products are obtained there? 14. What are the agricultural products of Brazil? 15. What is the condition of mining? Of manufacturing? 16. Name and locate the principal cities. 17. Give some reasons why Argentina is the most progressive country of South America. 18. What about its agriculture? 19. Lumbering and mining? 20. Manufacturing and commerce? 21. Name and locate its principal cities. 22. Give one

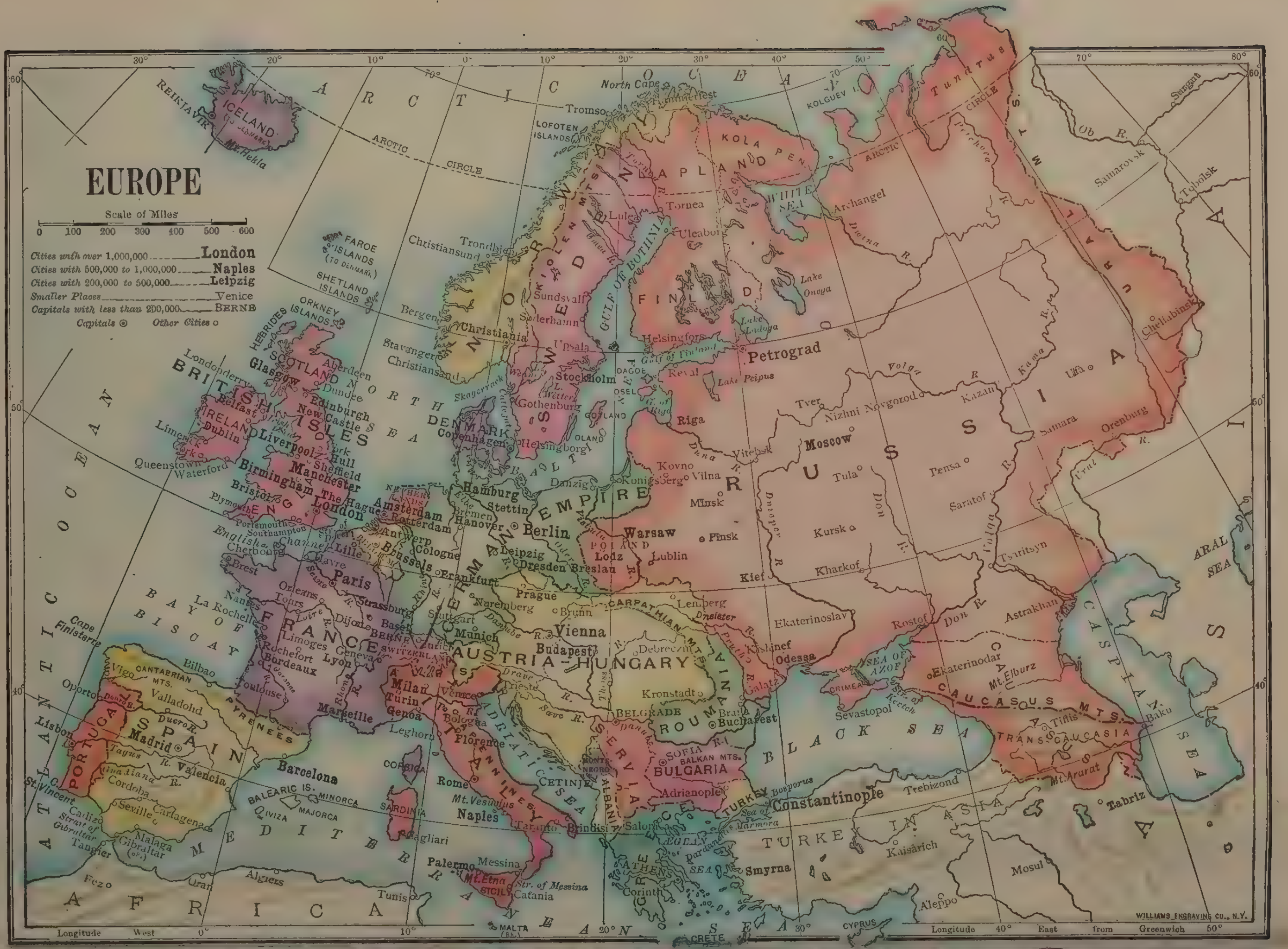
reason for the slower development of Uruguay. 23. What are its products? 24. Name and locate its chief city. 25. What kind of country is Paraguay? Tell about its products and chief city. 26. Name the Guianas. What about their products and commerce? 27. What are the surface features of Venezuela? 28. What are its products? 29. Locate the chief city. 30. How do the tropical Andean countries resemble one another in surface features? 31. In variety of climate and of farm products? 32. In abundance of minerals? 33. In location of principal cities? 34. In character of their government? 35. What about the surface features and the products of Colombia? 36. What is its leading city? 37. Describe the surface and climate of Ecuador. 38. What are its agricultural products? 39. What about mining and manufacturing? 40. Name and locate the principal cities of Ecuador. 41. What climate has Peru? 42. What about mining there? 43. Agriculture? 44. Manufacturing and transportation? 45. Name and locate its chief cities. 46. Describe the surface features of Bolivia. 47. Tell about mining in that country. 48. Agriculture. 49. Commerce and chief cities. 50. Describe the surface of Chile. 51. The climate. 52. What about mining there? 53. Agriculture? 54. Manufacturing? 55. Why has Chile made such progress? 56. Locate the chief cities. 57. Name, locate, and tell the principal facts about the islands near South America.

Comparisons with North America

1. Which of the two Americas has the advantage in regard to latitude? Show how. 2. Tell about the effects of the trade winds in each continent (Fig. 296). 3. Of the prevailing westerlies (Figs. 297 and 299). 4. Locate the arid sections in each continent, and give the reasons for the lack of rain (Figs. 296, 297). 5. Point out the rainiest section in each, and state the causes. 6. Which of the two continents has the better position for world commerce? Why? 7. Into what ocean do the principal rivers of South America flow? Of North America? 8. What can you say about the regularity of the coast of the two continents? Which has the advantage in this respect? How? 9. Locate the five principal coast cities of South America; of North America. State the main advantages of the location in each case. 10. What about the number of lakes in each continent and their value for commerce? 11. What about the number of large cities in the interior of each continent? 12. Compare both Brazil and Argentina with the United States in area; in population. 13. Compare Chile with Texas in these two respects. 14. Make a list of the important farm products common to South America and the United States. 15. Name some products that are extensively raised in one and not in the other. 16. Which parts of each continent are especially noted for cotton? Coffee? Wheat? Cattle and sheep? Copper? Precious metals? 17. What is the prevailing kind of government in North and in South America? What sections have a different kind of government?

Suggestions

1. Give several reasons why South America has been much less rapidly settled than North America. 2. How does the Spaniards' treatment of the Incas compare with their treatment of the North American Indians? 3. Find out some of the ways in which coffee is often adulterated. 4. Make a drawing of South America; a sand model. 5. If you were expecting to emigrate there, in what country would you prefer to settle? Why? 6. What products of South America are you probably seeing and using from week to week? 7. Is Brazil likely to rival the United States in importance in the future? Why? 8. Is it an advantage or disadvantage for South America that it is divided into so many more countries than North America? Why?


EUROPE
Scale of Miles
0 100 200 300 400 500 600
Cities with over 1,000,000 London
Cities with 500,000 to 1,000,000 Naples
Cities with 200,000 to 500,000 Leipzig
Smaller Places Venice
Capitals with less than 200,000 BERNE
Capitals ⊙ Other Cities ○
ARCTIC OCEAN
ARCTIC CIRCLE
ATLANTIC OCEAN
NORTH SEA
BAY OF BISCAY
MEDITERRANEAN SEA
BLACK SEA
CASPIAN SEA
ARAL SEA
BALTIC SEA
ADRIATIC SEA
AEGEAN SEA
SEA OF AZOF
WHITE SEA
GULF OF BOTHNIA
Gulf of Finland
ICELAND
REIKJAVIK
Mt. Hekla
FAROE ISLANDS (TO DENMARK)
SHETLAND ISLANDS
ORKNEY ISLANDS
HEBRIDES
LOFOTEN ISLANDS
KOLGUEV I.
BRITISH ISLES
SCOTLAND
IRELAND
ENGLAND
London
Glasgow
Edinburgh
Liverpool
Manchester
Birmingham
Dublin
Belfast
NORWAY
SWEDEN
Christiania
Stockholm
DENMARK
Copenhagen
LAPLAND
FINLAND
Helsingfors
Petrograd
RUSSIA
Moscow
Warsaw
Odessa
Kief
Riga
GERMAN EMPIRE
Berlin
Hamburg
NETHERLANDS
Amsterdam
Rotterdam
The Hague
BELGIUM
Brussels
FRANCE
Paris
Marseille
Lyon
Bordeaux
SWITZERLAND
BERNE
AUSTRIA-HUNGARY
Vienna
Budapest
Prague
ITALY
Rome
Naples
Milan
Turin
Genoa
SICILY
Mt. Etna
SARDINIA
CORSICA
SPAIN
Madrid
Barcelona
PORTUGAL
Lisbon
Oporto
PYRENEES
BALEARIC IS.
ROUMANIA
Bucharest
SERVIA
BELGRADE
BULGARIA
SOFIA
MONTENEGRO
CETINJE
ALBANIA
GREECE
ATHENS
TURKEY
Constantinople
TURKEY IN ASIA
Smyrna
CRETE
CYPRUS
MALTA
AFRICA
Algiers
Tunis
CAUCASUS MTS.
TRANSCAUCASIA
Mt. Elburz
Mt. Ararat
URAL MTS.
Tundras
ASIA
Longitude West from Greenwich
Longitude East from Greenwich
WILLIAMS ENGRAVING CO., N.Y.

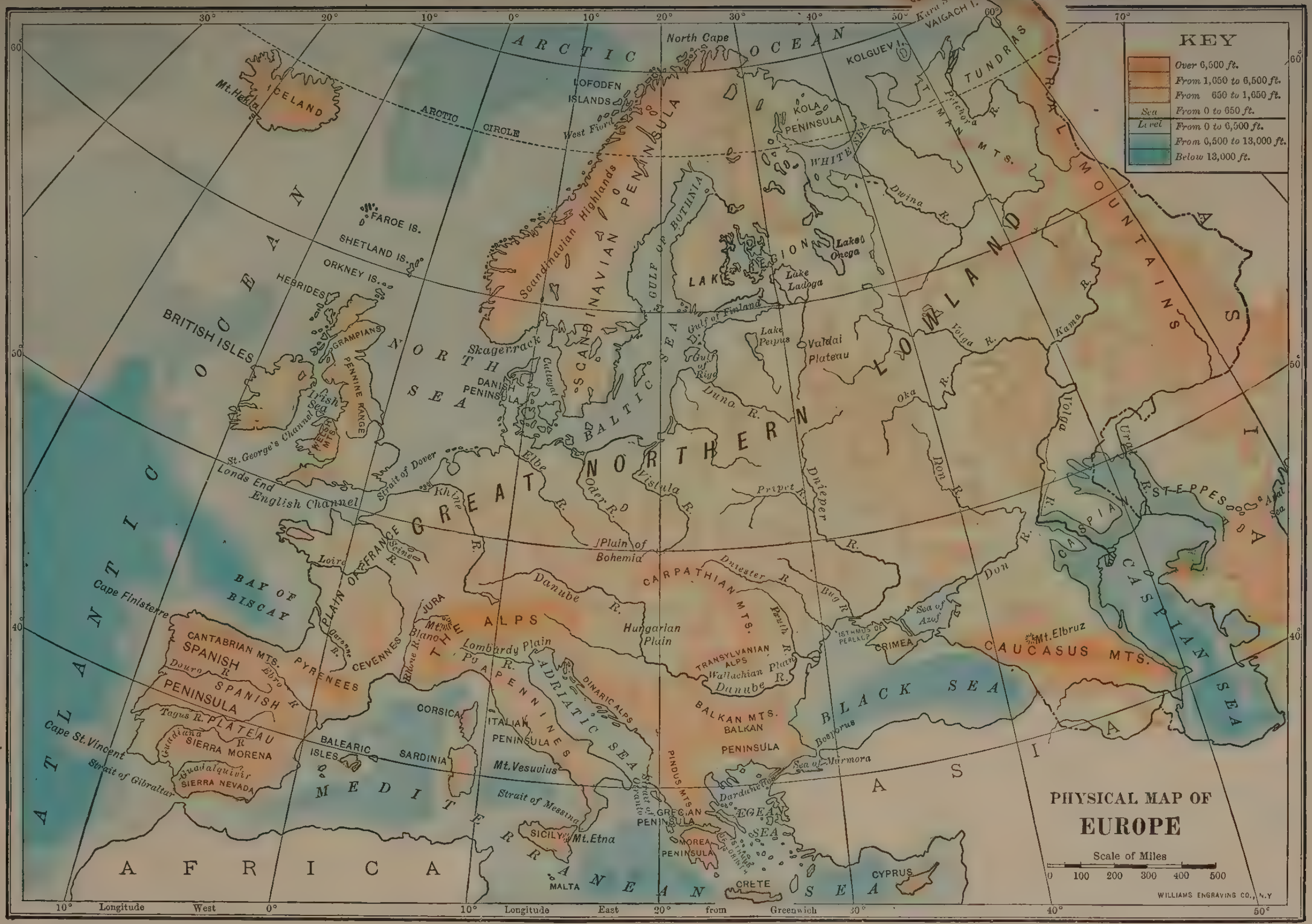

KEY
Over 6,500 ft.
From 1,650 to 6,500 ft.
From 650 to 1,650 ft.
From 0 to 650 ft.
Sea Level
From 0 to 6,500 ft.
From 6,500 to 13,000 ft.
Below 13,000 ft.
PHYSICAL MAP OF
EUROPE
Scale of Miles
0
100
200
300
400
500
WILLIAMS ENGRAVING CO., N.Y.
ARCTIC OCEAN
North Cape
KOLGUEV I.
VAIGACH I.
Kara Strait
TUNDRAS
URAL MOUNTAINS
TIMAN MTS.
Pitchora R.
LOFODEN ISLANDS
West Fiord
ARCTIC CIRCLE
ICELAND
Mt. Hekla
FAROE IS.
SHETLAND IS.
ORKNEY IS.
HEBRIDES
BRITISH ISLES
GRAMPIANS
PENNINE RANGE
Irish Sea
WELSH MTS.
St. George's Channel
Lands End
English Channel
Strait of Dover
ATLANTIC OCEAN
NORTH SEA
Skagerrack
Cattegat
DANISH PENINSULA
SCANDINAVIAN PENINSULA
Scandinavian Highlands
GULF OF BOTHNIA
BALTIC SEA
Gulf of Finland
Gulf of Riga
LAKE REGION
Lake Ladoga
Lakes Onega
Lake Peipus
Valdai Plateau
KOLA PENINSULA
WHITE SEA
Dwina R.
Kama R.
Volga R.
Oka R.
Duna R.
GREAT NORTHERN LOWLAND
Elbe R.
Oder R.
Vistula R.
Rhine R.
Pripet R.
Dnieper R.
Don R.
Ural R.
STEPPES
Aral Sea
CASPIAN SEA
CASPIAN
ASIA
Plain of Bohemia
PLAIN OF FRANCE
Seine R.
Loire R.
Garonne R.
CEVENNES
PYRENEES
BAY OF BISCAY
Cape Finisterre
CANTABRIAN MTS.
SPANISH PENINSULA
Douro R.
Ebro R.
SPANISH PLATEAU
Tagus R.
Guadiana R.
SIERRA MORENA
Guadalquivir
SIERRA NEVADA
Cape St. Vincent
Strait of Gibraltar
JURA
Mt. Blanc
Rhone R.
ALPS
Lombardy Plain
Po R.
APENNINES
ITALIAN PENINSULA
Mt. Vesuvius
Strait of Messina
SICILY
Mt. Etna
MALTA
CORSICA
SARDINIA
BALEARIC ISLES
MEDITERRANEAN SEA
ADRIATIC SEA
DINARIC ALPS
Strait of Otranto
Danube R.
Hungarian Plain
CARPATHIAN MTS.
TRANSYLVANIAN ALPS
Wallachian Plain
Dniester R.
Pruth R.
Bug R.
BALKAN MTS.
BALKAN PENINSULA
PINDUS MTS.
GRECIAN PENINSULA
MOREA PENINSULA
ISTHMUS OF CORINTH
EGEAN SEA
Dardanelles
Sea of Marmora
Bosporus
BLACK SEA
ISTHMUS OF PEREKOP
CRIMEA
Sea of Azof
CAUCASUS MTS.
Mt. Elbruz
CRETE
CYPRUS
AFRICA
Longitude West
Longitude East from Greenwich
10°
20°
30°
40°
50°
60°
70°

FIG. 359.

PART IV. EUROPE

Map Study

1. On the map (Fig. 358) trace the boundary between Europe and Asia. 2. What peninsulas are there? 3. What countries are wholly or partly on peninsulas? 4. How does Russia compare in area with the other countries of Europe? With the United States? (See Appendix, p. 424.) 5. Where are the principal mountains? 6. Name and locate the principal rivers. 7. The 40th parallel of latitude crosses what countries of Europe? Through or near what cities in the United States does it pass?

I. General Facts

Why called a continent

The continent of Europe was named when only the southern part of it was known. As people learned more about it, they found that Europe was connected with Asia, being, in fact, a great peninsula extending westward. We now know that Europe and Asia together really form a single continent, which is called *Eurasia*. But since Europe has been long considered a separate continent, and has been so important as the home of the civilized races, it is still the custom to class it as a continent.

Story of the continent

1. Formation of mountains in the northwest

As in the case of North America, the growth of the continent of Europe has required millions of years. Far back in time mountains appeared above the sea in several places, as in the northwestern portion of the continent. Although greatly worn away, these mountains may still be seen in Finland, Scandinavia, and Scotland (Figs. 359 and 360), as well as in Germany, Belgium, and other sections. They resemble the mountains of New England and eastern Canada.

2. Later mountain ranges, and their direction

Other mountain ranges were formed in southern Europe; but, like those of western America, they are younger and are far less worn away than the older mountains mentioned. Therefore the *Pyrenees* (Fig. 391), *Alps* (Fig. 430), and *Caucasus* (Fig. 361) mountains are still of great height. Find each on Figure 359. Besides the mountains named, there is a long, low chain, known as the *Urals*, which extends north and south along the eastern boundary of Europe. Other highlands are shown on Figure 360. Where are they mainly situated?

The highest mountains in Europe are in the south, and they extend in various directions, though mainly east and west. How does this arrangement promise to affect the climate? Next to the Caucasus (Fig. 361), the loftiest of all are the Alps (Figs. 430, 434). The rains and snows of the Alps find their way to the sea through several of the large rivers of Europe. What are the names of the largest (Fig. 359)? Headwaters of four of them — the Po, Rhone, Rhine, and Danube — are within forty miles of one another in the Alps.

Europe owes much of its very irregular outline to the fact that the mountains are not continuous, and consist of chains extending in various directions. How does Europe compare with North America in this respect? With South America?

3. The low plain between these mountains

Between the mountains of the northwest, the east, and the south there is an extensive lowland (Fig. 360). A part of this has been lowered beneath the sea by the sinking of the land, thus forming the shallow Baltic Sea. This plain extends from southern England, through Belgium and Holland,

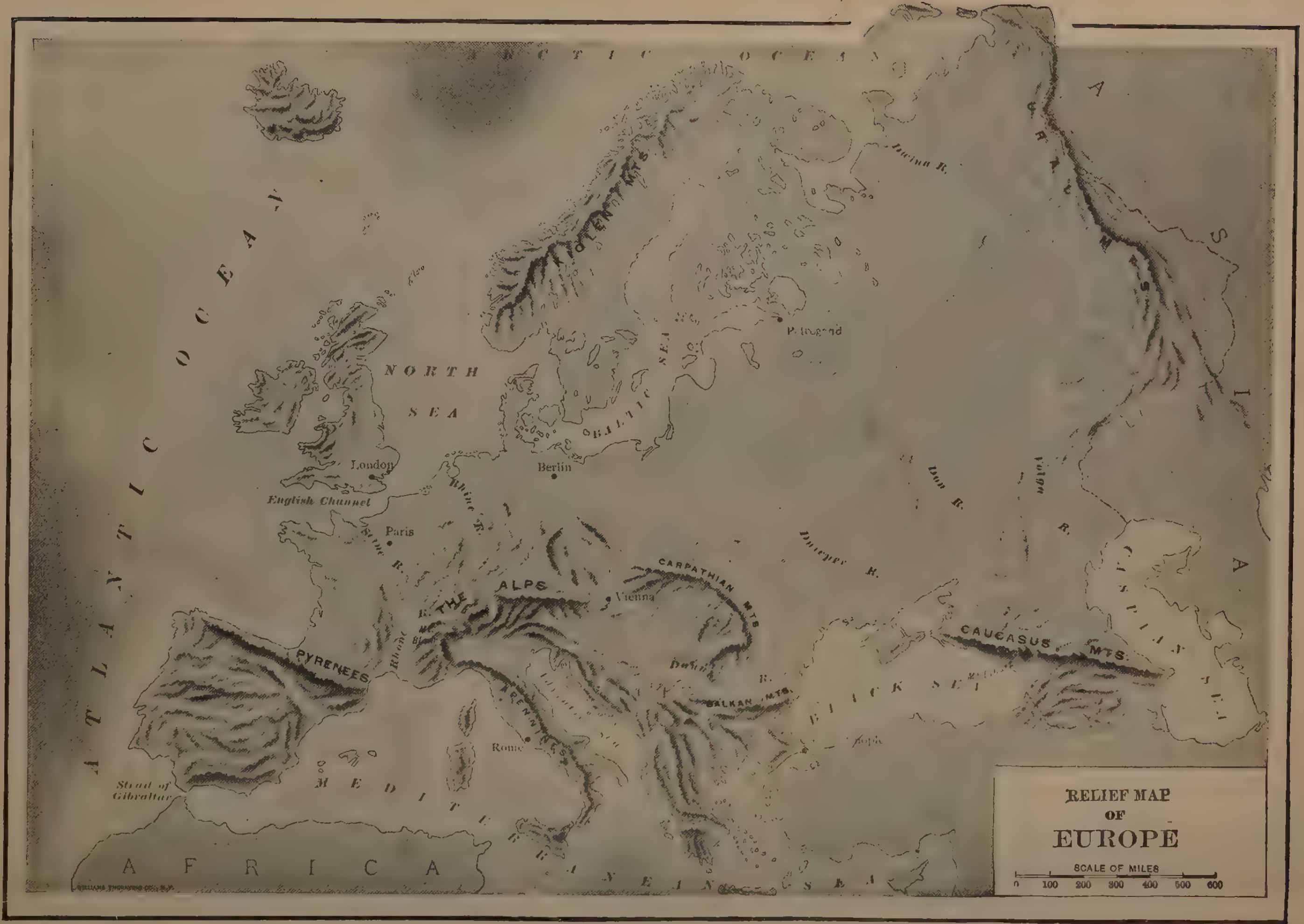

RELIEF MAP
OF
EUROPE
SCALE OF MILES
0 100 200 300 400 500 600
ARCTIC OCEAN
ATLANTIC OCEAN
NORTH SEA
BALTIC SEA
English Channel
Strait of Gibraltar
MEDITERRANEAN SEA
BLACK SEA
CASPIAN SEA
AFRICA
ASIA
ASIA
URAL MTS.
KJOLEN MTS.
THE ALPS
PYRENEES
APENNINES
CARPATHIAN MTS.
BALKAN MTS.
CAUCASUS MTS.
London
Paris
Berlin
Vienna
Rome
P. tugrad
Rhine R.
Seine R.
Rhone R.
Danube R.
Dnieper R.
Don R.
Volga R.
Dwina R.

FIG. 360.

or the "Low Countries," entirely across Germany (Fig. 420) and Russia (Fig. 360). It broadens toward the east until it includes almost all of Russia. Estimate its length from east to west. About two thirds of Europe is included in this plain.

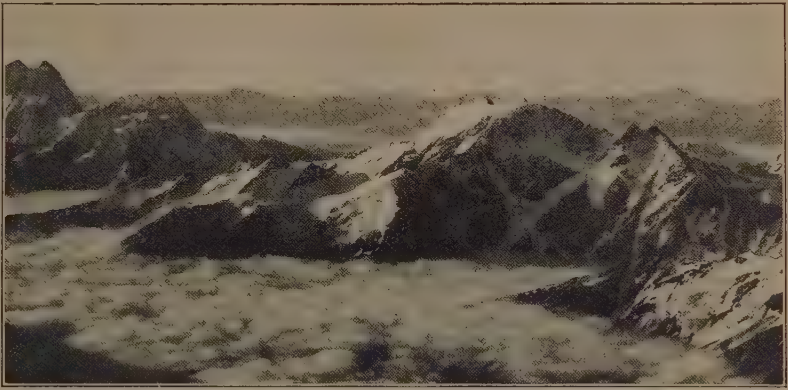


Fig. 361. — A view over the crests of the lofty snow-covered Caucasus Mountains. The valley in the front is filled with clouds.

4. Formation of coal beds; also kinds of coal While the mountains and plains were being made, coal beds were also forming, as was the case in America during the *Coal Period*. State once more how coal was formed (p. 2). Figure 362 shows the parts of Europe in which coal beds occur. In what countries are they found? Most of the coal is *bituminous*, though there is some *anthracite*. In a number of sections *lignite*, or brown coal, is mined; and *peat* is also dug for fuel in western Europe.

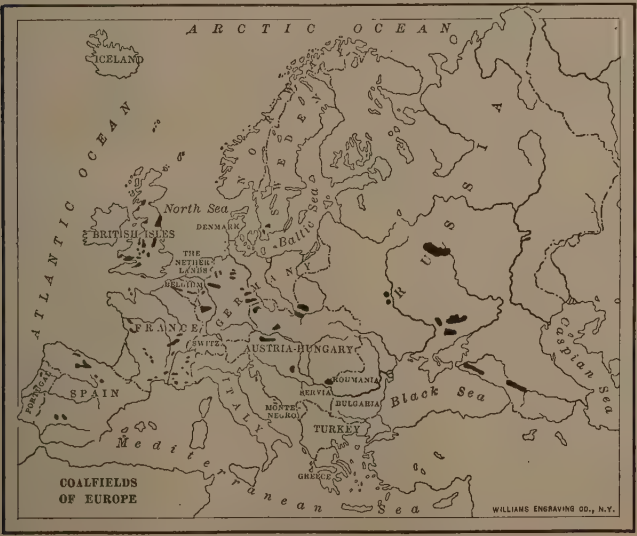


Fig. 362. — Map of the coal fields of Europe.

5. The great Ice Age At the same period that eastern North America was invaded by a great ice sheet from the north, snow gathered on the highlands of northwestern Europe and spread outward in all directions. Figure 363 shows the extent of the European ice sheet. It made the same changes in Europe as in our country. State what these changes were (p. 9).

6. Character of the coast line, and advantages it gives The irregular coast of northwestern Europe, like that of northeastern North America, is due to the sinking of the land. The Baltic Sea and its gulfs are old land valleys, sunk beneath the sea; and the hills of this sunken land form either islands, peninsulas, or shallow banks where food fish abound.

During the growth of the mountains of southern Europe, the rising and sinking of small areas of land has made many peninsulas, with bays, gulfs, islands, and seas between. The Mediterranean Sea occupies a basin, thousands of feet in depth, formed by the sinking of this part of the earth's crust. Some of the islands in the Mediterranean Sea were partly or wholly built up by volcanic action.

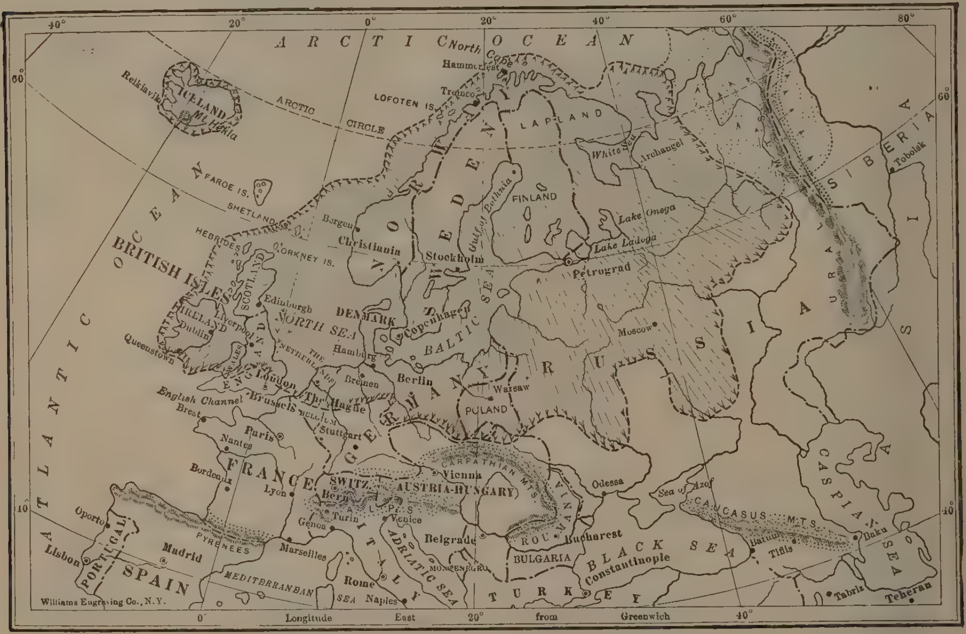


Fig. 363. — The ice sheet of Europe.

As a result of all these movements of the land, Europe has the most irregular coast of all the continents. Name the larger peninsulas, gulfs, and seas that border Europe. How about the number of fine harbors? Show, by examples, how such an irregular coast is of advantage in allowing vessels to sail far into the interior of the continent.

Climate

1. The latitude of Europe

Trace the 50th parallel of latitude on a globe or map of the world. Notice that while the 49th parallel forms the northern boundary of western United States, it passes entirely south of England, crosses France near Paris, and extends through southern Germany and Russia. From this it is seen that by far the larger part of Europe lies farther north than the United States, and due east of Canada. Petrograd is in the same latitude as northern Labrador; and the tips of the peninsulas of southern Europe reach no farther south than the southern boundary of Virginia.

2. The population and crops there

In spite of this latitude, and of the fact that Europe is much less than half the size of North America, that continent supports over three times as many inhabitants as our own, or over four hundred million persons.

It is true that, in the Far North, near the Arctic Ocean, the climate is bleak, and there are barren, frozen tundras. But south of this is a belt of fir, spruce, pine, and other trees. Within the forest belt, and south of it, the climate permits the growth of the grains and fruits that flourish in southern Canada and northern United States. Farther south, in southern Europe, in the latitude of central United States, such semi-tropical fruits as oranges, lemons, olives, and figs are cultivated. That is to say, the products of the greater part of Europe are such as grow several hundred miles farther south in eastern North America.

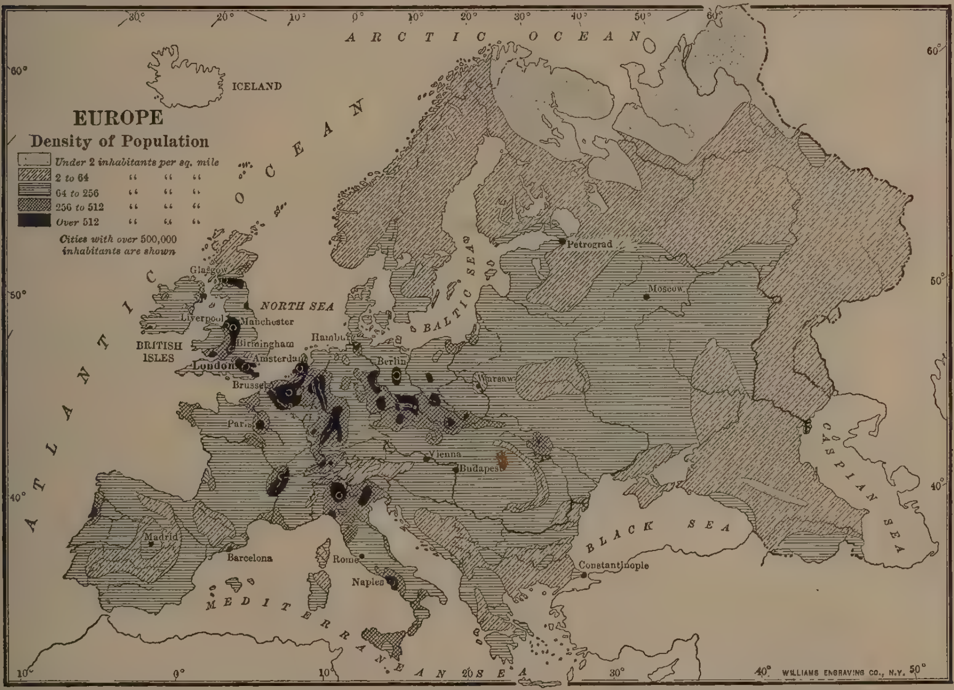


FIG. 364. — What reasons can you suggest for the fact that certain parts, like central Spain, northern Russia, and Scandinavia, and the country between the Black and Caspian seas, are not densely populated?

3. Explanation of these surprising facts

(1) The prevailing west winds

The prevailing westerlies are felt in northern Europe as well as in the United States (p. 212). Blowing from across the warm ocean waters (p. 223), they bring an enormous amount of heat to the land. It is these west winds, more than any other thing, that make it possible for crops to be raised nearer the pole in Europe than in any other part of the globe. Without such winds, much of that densely populated continent (Fig. 364) would be a barren waste, like Labrador.

(2) The absence of north and south mountain ranges in the west

In North America, where high mountains extend north and south along the entire western side of the continent, the warm, damp air soon loses its moisture as it moves eastward (p. 211). In Europe, on the other hand, where the higher ranges extend nearly east and west, the mountains interfere much less with the movement of vapor to the interior. For that reason the west winds give up their moisture little by little, and over a wide area. This is the chief reason why there is no arid land in the belt of westerlies, from western Ireland to eastern Russia. Another reason is that, in this cool northern climate, the soil loses little of its water by evaporation.

The effect of the ocean winds is naturally greatest near the coast, as in western North America. Therefore, England has a mild, rainy climate; but the farther east one goes, the less the influence of the ocean is felt. Thus, in eastern Russia there are great extremes of heat and cold, and there is danger of serious droughts. Compare the summer and winter temperature (Figs. 317 and 318) and the rainfall (Fig. 365) of these two sections.

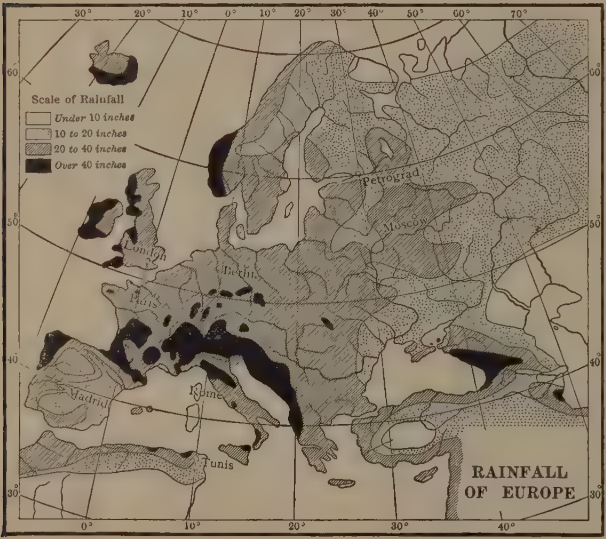


Fig. 365. — Rainfall map of Europe.

(3) *The inland seas*

The numerous inland seas are another important cause of the mild climate of parts of Europe. Draw an outline map of the continent, locating these seas. How does the Mediterranean compare in length with Lake Superior? It will be remembered that our Great Lakes produce a distinct influence on the climate of the neighboring land, reducing the heat of summer and the cold of winter (p. 93). It is partly because of this influence that southern Italy, Greece, France, and Spain have such an equable and semitropical climate. How must these seas affect the rainfall?

Why cyclonic storms bring little rain to eastern Europe

The cyclonic storms which pass over eastern North America often cross the ocean and continue across Europe (p. 217), causing variable winds, as in eastern United States and Canada. You will recall that the east winds of the cyclonic storms bring much rain to eastern United States (p. 215). They cannot do this in eastern Europe, because there is no great ocean near at hand to supply the vapor. Therefore the rainfall here is light.

Why southern Europe has a dry, mild climate

Southern Europe, like southern California, is not reached by the westerlies in summer, for it then lies within the belt of the horse latitudes. This accounts for the fact that southern Spain, Italy, and Greece receive very little rain in summer. Examine Figure 365 to see where the rainfall in Europe is light.

The east-west direction of the lofty mountains exerts a great influence on the climate of the countries that lie to the north and south of them. Rising like great walls, these mountains prevent south winds from bearing northward the heat of the Mediterranean basin; and they also interfere with the passage of cold north winds. Northern Florida, much farther south than southern Europe, is sometimes visited by cold waves and frosts; but such winds cannot reach portions of southern Europe that are protected by the mountains.

Reasons for the many countries

The people of Europe have never been bound closely together as one great nation. One of the reasons for this is the fact that so many parts of the continent are separated from all others. Spain, for example, is not only a peninsula, but it is separated from France by lofty mountains. The British Isles are entirely cut off by water; Scandinavia nearly so; and Italy is bounded on the north by the Alps, and on all other sides by water.

It is natural that people living in such positions should not feel a common interest with those who are so separated from them. Thus many different customs, beliefs, and languages have arisen; and because of these

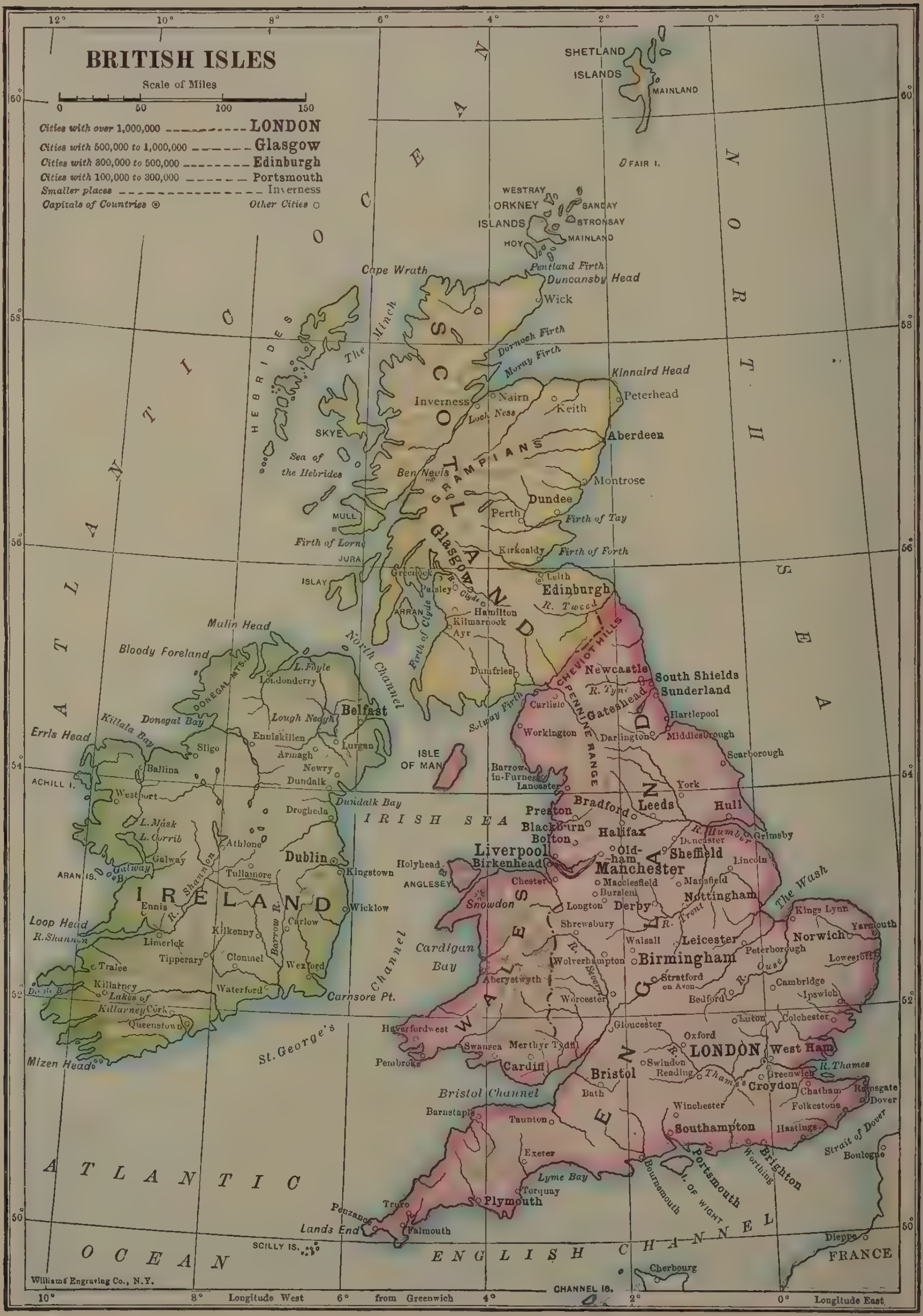

BRITISH ISLES
Scale of Miles
0
50
100
150
Cities with over 1,000,000 LONDON
Cities with 500,000 to 1,000,000 Glasgow
Cities with 300,000 to 500,000 Edinburgh
Cities with 100,000 to 300,000 Portsmouth
Smaller places Inverness
Capitals of Countries ⊙
Other Cities ○
12°
10°
8°
6°
4°
2°
0°
2°
60
58
56
54
52
50
ATLANTIC OCEAN
NORTH SEA
SHETLAND ISLANDS
MAINLAND
FAIR I.
WESTRAY
ORKNEY ISLANDS
SANDAY
STRONSAY
MAINLAND
HOY
Pentland Firth
Duncansby Head
Wick
Cape Wrath
The Minch
HEBRIDES
SCOTLAND
Dornoch Firth
Moray Firth
Kinnaird Head
Peterhead
Inverness
Nairn
Keith
Loch Ness
Aberdeen
SKYE
Sea of the Hebrides
GRAMPIANS
Ben Nevis
Montrose
Dundee
Perth
Firth of Tay
MULL
Firth of Lorne
JURA
ISLAY
Glasgow
Kirkcaldy
Firth of Forth
Leith
Edinburgh
R. Tweed
Greenock
Paisley
R. Clyde
Hamilton
ARRAN
Firth of Clyde
Kilmarnock
Ayr
Dumfries
Malin Head
North Channel
Bloody Foreland
DONEGAL MTS.
L. Foyle
Londonderry
Belfast
Lough Neagh
Donegal Bay
Killala Bay
Erris Head
Sligo
Enniskillen
Lurgan
Armagh
Newry
Dundalk
Ballina
ACHILL I.
Westport
L. Mask
L. Corrib
Athlone
Drogheda
Dundalk Bay
Galway
ARAN IS.
Galway B.
IRELAND
R. Shannon
Tullamore
Dublin
Kingstown
Wicklow
Ennis
Loop Head
R. Shannon
Limerick
Kilkenny
Carlow
Tipperary
Clonmel
Barrow R.
Wexford
Tralee
Dingle B.
Killarney
Lakes of Killarney
Cork
Queenstown
Waterford
Carnsore Pt.
Mizen Head
St. George's Channel
IRISH SEA
ISLE OF MAN
CHEVIOT HILLS
PENNINE RANGE
Solway Firth
Carlisle
Newcastle
R. Tyne
Gateshead
South Shields
Sunderland
Hartlepool
Workington
Darlington
Middlesbrough
Scarborough
Barrow-in-Furness
Lancaster
York
Preston
Bradford
Leeds
Hull
Blackburn
Bolton
Halifax
R. Humber
Grimsby
Doncaster
Liverpool
Birkenhead
Oldham
Sheffield
Lincoln
Manchester
Holyhead
ANGLESEY
Chester
Macclesfield
Burslem
Mansfield
Nottingham
The Wash
Snowdon
Longton
Derby
R. Trent
Kings Lynn
Yarmouth
WALES
Shrewsbury
Walsall
Leicester
Norwich
Cardigan Bay
R. Severn
Wolverhampton
Birmingham
Peterborough
Lowestoft
Aberystwyth
Stratford on Avon
R. Ouse
Cambridge
Ipswich
Worcester
Bedford
Luton
Colchester
Haverfordwest
Gloucester
Oxford
LONDON
West Ham
Swansea
Merthyr Tydfil
Pembroke
Cardiff
Swindon
Reading
R. Thames
Greenwich
Bristol
Croydon
Chatham
Ramsgate
Dover
Bristol Channel
Bath
Folkestone
Barnstaple
Taunton
Winchester
ENGLAND
Southampton
Hastings
Strait of Dover
Exeter
Portsmouth
Worthing
Brighton
Boulogne
Lyme Bay
Bournemouth
I. OF WIGHT
Torquay
Truro
Plymouth
Penzance
Lands End
Falmouth
SCILLY IS.
ENGLISH CHANNEL
Dieppe
FRANCE
Cherbourg
CHANNEL IS.
Williams Engraving Co., N.Y.
Longitude West
from Greenwich
Longitude East

FIG. 366.

differences there are many more nations in Europe than in North America. Count them (Fig. 358).

Many jealousies and disputes have arisen between the different nations. These have often led to war, as a result of which one nation has sometimes seized territory from another. In this way the boundaries between the nations have suffered many changes. Notice how irregular some of the boundary lines are. Those of Germany, for example, have been agreed upon only after the loss of tens of thousands of human lives in war.

Review Questions

1. Why is Europe classed as a continent? 2. In the growth of the continent, tell about the formation of mountains in the northwest. 3. Where else are mountains found? What do you know about them? 4. Describe the large plain. 5. Where are the coal beds? What kinds are found? 6. Locate the boundaries of the ice sheet (Fig. 363). What are some of its effects? 7. Explain the irregular coast line, and state some of its advantages. 8. What is the latitude of Europe? 9. What about the population, and the farm products? 10. How is the climate influenced by the prevailing westerlies? 11. By the absence of north and south mountain ranges in the west? 12. By the inland seas? 13. Why do not the cyclonic storms supply abundant rains in eastern Europe? 14. Why is the climate of southern Europe dry and mild? 15. Give some reasons for so many countries in Europe. Why are the boundary lines often irregular?

Comparisons with North America

1. Compare Europe with North America in regard to highlands. 2. Lowlands. 3. Rivers. 4. Distribution of coal beds (Fig. 268). 5. Extent of ice covering. 6. Character of coast line. 7. Latitude. 8. Population. 9. In what respects are the two continents alike in climate? 10. In what respects unlike in climate? 11. Compare the number of degrees of longitude in Europe with the number in North America. 12. Where are the most densely settled parts in each continent? Why this difference?

Suggestions

1. What results might follow if the mountains of Europe extended north and south near the western coast? 2. Mention some of the results if the land should rise near Gibraltar, changing the Mediterranean to a closed sea. How would the British Isles be influenced? Also Italy? 3. Can you tell about any of the great wars and generals of Germany, England, or France? 4. Can you tell of any of the changes in boundary lines; for example, in Poland or between France and Germany?

II. The British Isles

Map Study

1. Walk toward the British Isles. 2. What two large islands do they include? 3. What waters separate these two? 4. Name the three divisions of Great Britain. 5. Locate the Orkney, Hebrides, Shetland, and Channel Islands. They are included among the British Isles. 6. What sea lies east of Great Britain? 7. What country is nearest to Great Britain (Fig. 358)? What waters separate the two? 8. Compare the coast line with that of Spain (Fig. 390); of Norway (Fig. 358).

Remarkable facts about these isles

London is fully seven hundred miles farther north than New York City, and the British Isles are in the same latitude as Labrador. England itself is a little smaller than Alabama; and the British Isles, including England, Wales, Scotland, Ireland, and several hundred small islands, are about the size of the state of New Mexico.

Yet in spite of their northern position and their small area, the largest city in the world is located in the British Isles. Moreover, Great Britain has more manufacturing than any nation excepting the United States. It has more foreign trade, a greater number of vessels upon the sea, and more colonies (Fig. 381) than any other nation on the earth.

Their importance partly explained

1. By the character of their inhabitants

The character of the British people doubtless offers one important explanation of the above facts. Being so near the mainland, the islands have been invaded by many hardy people, among them the *Angles* and *Saxons*, from whom the words *English* and *Anglo-Saxons* have been derived. The *Normans* also entered Britain, and still earlier the Romans under the lead of Julius Cæsar.

Although formerly divided into different nations, England, Scotland, Wales, and Ireland are now united to form the *United Kingdom of Great Britain and Ireland.*

The inhabitants of each of these sections are noted for their energy, intelligence, and good character.

2. By the prevailing winds

The prevailing westerly winds also partly account for the greatness of the United Kingdom. Two days out of three these winds blow across the British Isles; and, since they have crossed a vast expanse of warm water (p. 261), they greatly temper the climate. Indeed, the winter season is milder than that in northern United States, and the summer is cooler (Figs. 317 and 318).

The prevailing westerlies, bearing an abundance of moisture (p. 261), so distribute it over the islands that no section suffers from drought. Yet the western portions receive more rain than the eastern, because the damp ocean winds reach them first (Fig. 367).

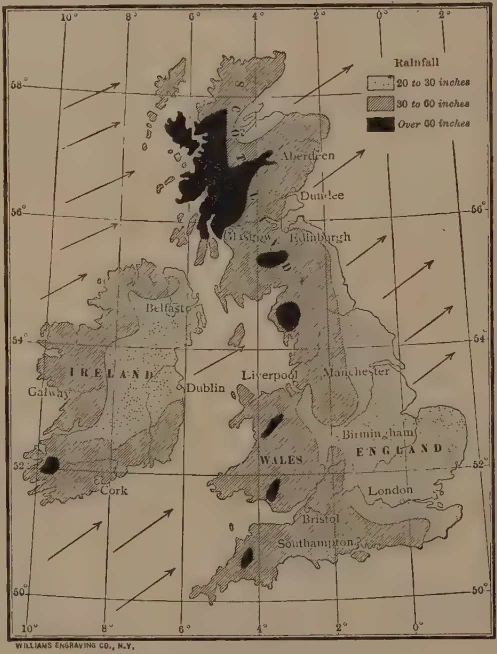


Fig. 367. — Rainfall of British Isles.

3. By the character of the surface

As already stated (p. 257), the mountains of Great Britain, like those of New England, are so old that they are worn very low. While these uplands rarely rise more than one or two thousand feet above sea level, there are occasional higher peaks of hard rock. For example, the granite peak of Ben Nevis, in Scotland, the highest point in the British Isles, is forty-three hundred feet in elevation. The *Scottish Highlands* (Fig. 368) are so rugged and barren that few people are able to live there.

Where the rocks are softer, and less disturbed by mountain folding, there are lower and more level tracts. Point out the broadest lowland of Ireland, Scotland, and England (Fig. 359). A narrow and very small, but important, lowland lies in southern Scotland, near Edinburgh and Glasgow. There the rocks are so much softer than those of the highlands that, instead of a barren, hilly country, there is a fertile lowland. Upon this, called the *Lowlands of Scotland*, there are thriving industries and a dense population, as in many parts of England.

A highland rim extends around Ireland (Fig. 359), inclosing a lower, more level interior. Thus the surface of this island has the form of a shallow plate, and much of the land can be cultivated.

A large part of these islands, therefore, is either plain or low, hilly land, suited to agriculture. Thus the surface features have helped to make the British Isles an important nation.

4. By the irregular coast line

The coast line of the British Isles is very irregular, as may be seen from the map (Fig. 366). State the reasons (p. 259). How does the coast compare with that of New England? Since the mountainous western portion had more deep valleys for the sea to enter than the level plains of the east, there are more good harbors on the west than on the east coast. On both sides, however, the mouths of the larger rivers usually make good ports. Why?

Another reason for the importance of the United Kingdom is the fact that these islands

5. By the natural resources

have great natural resources, and have therefore developed important industries. In our study of the United States we found that the people are mainly engaged in lumbering, agriculture, fishing, mining, manufacturing, and commerce. There is very little lumbering in the British Isles for, although in early times a large part of the land was wooded, little forest now remains; and lumber is, therefore, one of the leading imports. But all of the other industries are important, and some of them are remarkably developed.

Fig. 368. — Sheep grazing on the mountain slopes in the Scottish Highlands.

Agriculture
1. Live Stock

Since no portion of the British Isles is arid, the ranching industry is not developed there as in western United States. Much live stock is raised, however (Fig. 368). In fact, grazing has of late so increased in importance that there is now twice as much land in pasture as in crops, and the British Isles are noted for their great number of fine cattle, sheep, and horses. There are about thirty million sheep on the Isles, while there are forty-five million people. The Shetland Islands are famous for Shetland ponies; and on the three Channel Islands, — Jersey, Guernsey, and Alderney, near the French coast, — three breeds of cattle have been developed, which are well known in the United States.

The importance of grazing is partly explained by the fact that much of the surface, like that of New England, is too rocky or mountainous to be cultivated (Fig. 368). Besides this, some of the plains in eastern England, although too sterile for farming, make excellent pasture land (Fig. 369). The mild winters and the damp air, which encourage the growth of grass, further favor stock raising. In addition, the cheapness with which grain is raised in other countries, like the United States, and carried to the British Isles, has made it less necessary for the British to use their land in raising grain.

2. Other farm products

The cool summer climate, which is of advantage in some respects, is unfavorable to many kinds of farming. For example, it prevents the production of corn, cotton, tobacco, and grapes, which require warm summers. More hardy products, however, such as oats, barley, and wheat, are easily raised. Turnips, potatoes, beans, and peas are other important crops; also hops, which, together with barley, are used in the manufacture of beer. Owing to the many towns and cities, truck farming is of great importance.

The demand for farm land has been so great that large areas of swamp have been reclaimed by careful drainage, and these now make some of the most fertile farms. Yet in spite of the care that has been given to cultivating the soil, and to raising live stock, far less food is produced in the British Isles than is needed by the inhabitants. There are such vast multitudes of people engaged in other

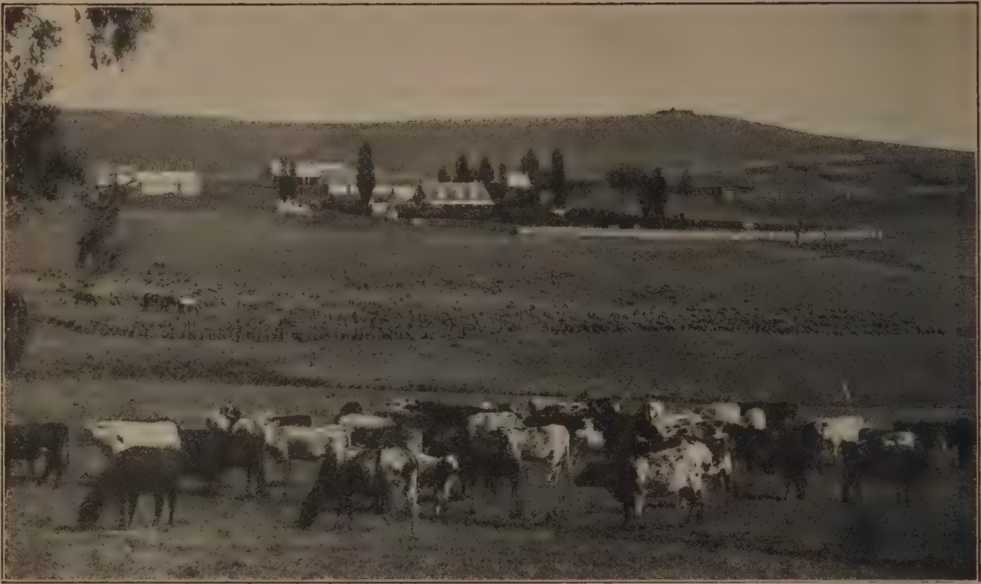


FIG. 369. — An English farm with a flock of sheep and a herd of cattle grazing in the pasture.

occupations that, if they were deprived of food from abroad, they would, it is said, begin to suffer from famine within a month. How different that is from our own country, which has so large an area, and so varied a climate, that it not only supplies the food we need, but produces enormous quantities to be sent abroad!

Fishing

Since the early inhabitants had to cross the sea in order to reach these islands, and since most of their descendants have lived either on or near the coast, it is natural that many of the British should adopt a seafaring life. This sort of life has also been encouraged by the fact that food fish abound on the shallow banks of the North Sea and of the ocean to the north and west of the islands. More than one hundred thousand men and twenty-five thousand boats from the British Isles are employed in fishing.

Among the fish caught are cod, haddock, and herring, as off the coast of New England and Newfoundland. Another important kind is a flatfish, the sole, which resembles the flounder of our eastern coast. Salmon enter the rivers of northern Great Britain, and oysters are found along the southern

FIG. 370. — An English country scene. On the left of the road, bordered by hedges, is a field of wheat; on the right, watercress is being raised.

coast. Many fishing hamlets are scattered along the coast; but the fishing industry here, as in our country, is becoming centered more and more in the large towns, which possess the capital for large vessels and expensive fishing outfits. The chief fishing centers, like Boston and Gloucester in Massachusetts, are LONDON, HULL, and GRIMSBY (Fig. 366) in England, and ABERDEEN in Scotland.

Mining

1. The less common minerals

One of the resources of the British Isles which early attracted people from southern Europe was the tin in southwestern England. This metal is not mined in many parts of the world, but has always been in great demand. Even before the time of Cæsar, ships from the Mediterranean came to England to obtain tin for use in the manufacture of bronze. Small quantities of copper, lead, zinc, and even gold and silver ores, have also been discovered in the British Isles; but at present there is little mining of these metals.

2. Coal and iron ore

On the other hand, the abundance of two other minerals, coal and iron ore, reminds us of our own country (pp. 3 and 259). The one small island of Great Britain produces more than half as much coal as all of our states together; and the United States and Great Britain are the two leading coal-producing countries of the world. Figure 371 shows the sections of Great Britain in which coal is found. While most of the coal is bituminous, that in southern Wales is more like our anthracite. Large numbers of miners in the United States are Welshmen who have come from that section.

Iron ore is also abundant and favorably situated. None of the British iron ore is far from coal; and in some places the same shaft is used to bring both coal and iron to the surface. Limestone is also abundant and near at hand. This reminds us of the conditions at Birmingham, Ala. (p. 79), which is named after BIRMINGHAM, England, because they resemble each other in having an abundance of coal and iron ore near together. Find Birmingham in Figure 371. Note the other cities near the coal fields. Why should large manufacturing cities develop here? The extent of the mining industry in the United Kingdom is indicated by the fact that more than half a million persons are employed underground.

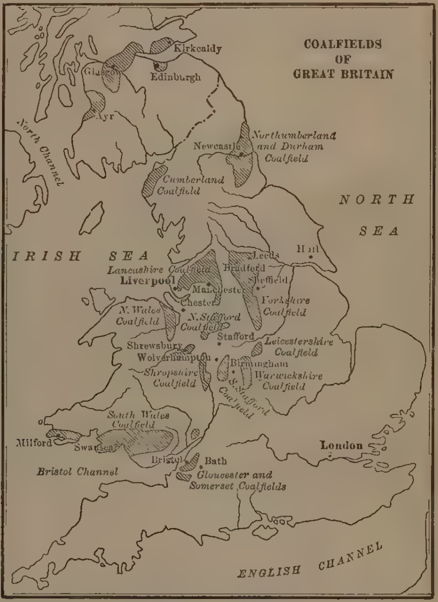


FIG. 371. — Map showing coal distribution in British Isles.

3. Other important mineral products

Besides these minerals, various building stones are extensively quarried, as granite in Scotland, and slate in northern Wales. Salt is also found; and there is clay of such excellent quality for earthenware that several towns have become noted for their potteries, as have Trenton and Cincinnati in the United States.

Manufacturing

1. Conditions favorable to its development

Considering the abundance of coal and iron ore on the one hand, and of wool from the millions of sheep on the other, it is clear that Great Britain has materials for extensive manufacture. As in

New England, the hilly sections have abundant water power due to the glacier, and this also has favored manufacturing. Later, when the use of steam became known, the abundant stores of coal were of great importance.

The use of steam has led to the building of many factories, and to the growth of large manufacturing cities. Therefore, the making of cloth on hand looms, at the homes of the weavers, has been generally abandoned, although one still sees it in some of the country districts.

FIG. 372. — A country road in England.

Even in very early times the English were engaged in the weaving of woolen cloth. Later, owing to numerous wars, and to bad government on the continent, England became a refuge for industrial people from the mainland. This led to rapid progress in manufacturing. The peculiar energy and inventive genius of the British, which kept their machinery in advance of that used by other nations, must also be considered. For example, it was a Scotchman, James Watt, who invented the modern steam engine; and it was George Stephenson who invented the first locomotive.

The very smallness of the country is another advantage; for no matter where a factory may be located, it is sure to be not far from coal fields, and within a few miles of a shipping point.

2. Leading kinds

(1) *Woolen manufacturing*

In the mountainous section of northern England, near both coal and wool, there are hundreds of factories for the manufacture of woolen cloth. The principal center of this trade is LEEDS, which has the added advantage of water power. On the western side of this hilly region is BRADFORD, noted for its broadcloth and worsted goods; and neighboring cities manufacture woolen yarn, hosiery, carpets, and blankets. The woolen industry extends northward into Scotland and southward to LEICESTER, where the surrounding plains produce a breed of sheep that yields a wool suitable for the manufacture of worsted yarn.

In spite of the enormous number of sheep in the British Isles, the manufacturing industry has so far outgrown the local supply of wool that millions of pounds must be imported every year. This condition resembles that of New England, where much of the wool is brought from the West or from foreign countries.

(2) *Cotton manufacturing*

From the spinning and weaving of wool it was easy to turn to the manufacture of cotton goods; and on the western side of the northern mountains we find a great cotton-manufacturing industry. Dampness is one of the points in favor of that section, for in a dry air cotton is in danger of becoming too brittle to spin and weave easily. Another reason why this work is best developed on the west side of the island is the fact that it is nearer the United States, from which so much of the raw cotton comes.

Since the British climate will not permit the cultivation of cotton, it is necessary to import all that is used. It requires over two billion pounds a year to supply the mills. Although much cotton is now obtained from Egypt, India, and other parts of the British Empire, our Southern States still supply the greatest quantity. The center of the cotton manufacturing is MANCHESTER. What other cities do you find situated near by?

The central portion of Great Britain, including southern Scotland and the two sides of the mountain range of northern England, is the seat of the greatest textile industry in the world. Can you name cities of New England which are likewise engaged in cotton and woolen manufacture (p. 42)?

FIG. 373. — Loch Lomond, a beautiful lake on the southern border of the Scottish Highlands.

(3) *Iron and steel manufacturing*

The cities of Great Britain that are most noted for iron and steel products are BIRMINGHAM and SHEFFIELD in England, and GLASGOW in Scotland. BIRMINGHAM manufactures jewelry, watches, firearms, bicycles, steam engines, etc. SHEFFIELD has for centuries been noted for its cutlery, the presence of grindstone quarries in the neighborhood being one reason for this particular industry. Why? Sheffield also manufactures steel rails and armor plates for war ships. GLASGOW is a center for shipbuilding and for the manufacture of locomotives and machinery of various kinds. In the smaller cities and towns near these places, there are similar works.

As in New England, many places occupied with the textile industry also produce textile machinery and other iron and steel goods. The island is so small that coal and iron are cheaply shipped to all points; and on this account, manufacturing, though best developed near the coal fields, is not confined to these districts.

Thus we see that here, as in the United States, coal makes possible an enormous manufacturing industry. There is so much coal in Great Britain that, in spite of the forest of chimneys in England and southern Scotland, the output of coal is more than sufficient to meet the demands. The raw materials for manufacture, however, are not sufficient; for all the cotton, much of the wool, and part of the iron ore must be imported.

The three industries connected with cotton, wool, and iron have made Great

Britain one of the great workshops of the world. The most important is cotton manufacturing; iron ranks next; and wool is third.

Contrast of Ireland with Great Britain

1. In prominence of its agriculture

What has thus far been said applies chiefly to Great Britain; but Ireland forms a striking contrast to Great Britain in several respects. In the first place, it is mainly a country of farms instead of manufactures (Fig. 374). The mild climate and damp air insure excellent grass throughout the year, and about four fifths of the farm land is in pasture. It follows, therefore, that great numbers of cattle, sheep, and horses are raised. As in Great Britain, the principal grain is oats; but barley, wheat, potatoes, and turnips are also grown.

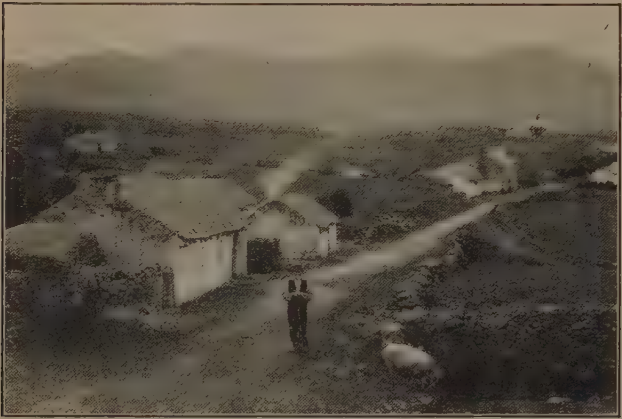


Fig. 374. — A country village in Ireland, surrounded by pastures and fields of grain.

2. In mining

Again, unlike Great Britain, Ireland is very barren of minerals. Building stones, such as granite, marble, and sandstone, are found, but there is very little coal or iron.

The lack of coal for domestic use is partly made up by the abundance of "turf," or peat. Owing to the deposits of glacial drift, which have formed dams across the streams (Fig. 363), the level interior is so poorly drained that swamps, or *bogs*, occupy about one twelfth of the entire surface of the island. The water in these bogs protects the swamp vegetation from decay, so that such vegetation collects until it forms a sod, which, when dug up and dried, makes a fairly good fuel (Fig. 8). It will be remembered that similar deposits, in the larger swamps of the Coal Period, were the beginning of the coal beds which are now of so much value (p. 2).

3. In manufacturing

On account of the lack of fuel, most of the manufacturing in Ireland is done on the eastern side, where coal is easily obtained from England or Scotland. At one point the two islands are only thirteen miles apart. One of the most important manufacturing industries is the making of linen. The Irish linens, which take high rank in our country, are made from the inner bark of the flax plant. Flax is grown in various parts of the United States, but mainly for the sake of the seed, from which linseed oil is made for use in mixing paints and in making varnish. In Ireland, however, flax is raised chiefly for its fiber. The damp climate there is favorable to its growth, and the cheap labor makes possible the great amount of care required in preparing it for the manufacture of linen.

The stem of flax is tall and slender, and a field of it presents somewhat the same appearance as a field of oats. Instead of being cut, like grain, it is pulled up and left lying upon the ground for some time, exposed to the weather, so that the gummy substance, which holds the woody matter and fiber together, may decay. Travelers in northern Ireland, in summer, see field after field covered with flax, much of which is used in the linen factories of BELFAST.

After the fiber has been separated from the woody core by machinery, it is split and combed out with a steel brush, and thus made ready for spinning. It is made into thread in much the same way as cotton and wool are, and this is then woven into napkins, tablecloths, etc. Name other articles made of linen.

Ireland offers a fourth contrast to Great Britain in regard to population. Not only is it far less

4. In population

densely peopled, but the number of inhabitants is decreasing. Partly because of the unfavorable laws imposed by England, the Irish have long been discontented with their lot; and for many years they have been leaving their country. Since 1847, the number of inhabitants has been reduced from eight million to four million four hundred thousand. They have sought refuge chiefly in the United States and Canada.

Principal cities

1. Their location, and connection with one another

The cities most noted for manufacturing have already been mentioned; namely, LEEDS, BRADFORD, MANCHESTER, SHEFFIELD, BIRMINGHAM, and GLASGOW. What industries are developed in each? Tell where each is located.

There are other large cities along the coast; for so much manufacturing calls for an enormous import of raw materials and food, as well as the export of manufactured goods. These cities must, therefore, be the gateways to and from the island. Since Great Britain lies far north, between Europe and the New World, these shipping points are naturally located on the eastern, western, and southern sides, at those points where the best harbors exist, and not far from the great industrial centers.

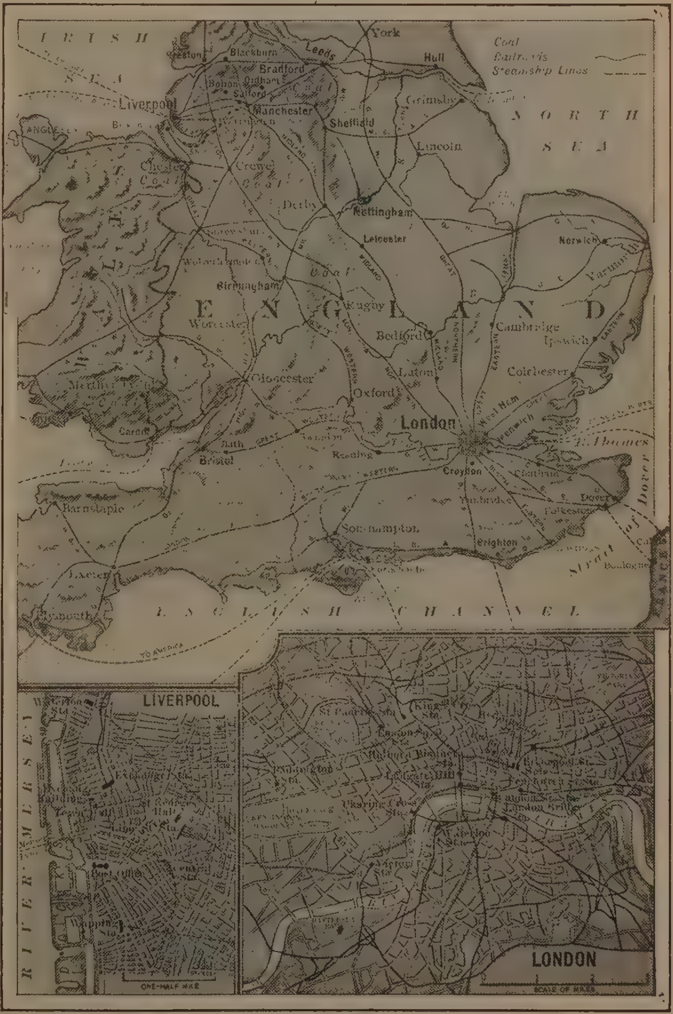


FIG. 375.—The location of London and Liverpool.

First among the coastal cities to be noted is LONDON, on the east side, with BRISTOL opposite it on the west coast. North of London is HULL, with LIVERPOOL on the opposite side; and in southern Scotland is EDINBURGH, near the coast, paired with GLASGOW on the west. On the south side the two most important ports are SOUTHAMPTON and PORTSMOUTH. What are the two principal cities of Ireland? Locate each.

Steamships, railway lines, and canals connect the various cities, carrying immense quantities of freight. In Great Britain and Ireland there are nearly four thousand miles of canal and over twenty-three thousand miles of railway.

2. London

(1) *Its location*

London, the capital of the empire and the largest city in the world, is situated on the Thames River. Like many other British rivers, the Thames has a wide, deep mouth, owing to the sinking of the land. London is located upon its banks as far inland as high tide allows vessels to go, or fifty miles from the open sea. The advantage of this position lies in the fact that, while it is in the interior of the island, it has direct water communication with foreign countries.

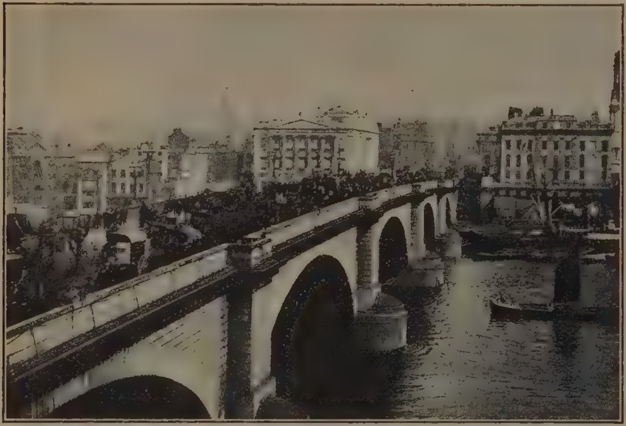


FIG. 376. — London Bridge across the Thames, over which a stream of people and wagons is almost constantly passing.

New York, we know, owes its greatness largely to the fact that it is the gateway to a productive interior, with an enormous area; but almost any point in England may be reached by rail from London in a few hours. Although Great Britain is so small, its population is nearly one half as great as that of the entire United States; and the port of London is the point of entrance for much of its food.

(2) *Early history and present size*

Even before the Romans came to England, the site of London was a fortified camp, situated on a low hill surrounded by tidal marshes and mud flats. The Romans had a ferry at this point; and much later, over eight hundred years ago, the first London Bridge was built (Fig. 376). This gave the city a great start. Since that time, it has grown until Greater London now includes over 7,000,000 persons. How does that compare with the number in Scotland? In Ireland? In New York City?

(3) *Manufacturing and commerce*

As in all great cities, one of the principal industries is manufacturing. Nearly all kinds of goods are made, as in New York, Chicago, and Philadelphia. However, the fact that London lacks coal and iron near at hand, places it at some disadvantage in manufacturing as compared with Liverpool and Glasgow.

London is the greatest shipping point in the world. Its rows of piers extend twenty miles down the river, and its railways radiate in all directions (Fig. 375). It is not so noted for its export of manufactured goods as are Liverpool and Glasgow, which are nearer the great manufacturing districts; but it is the chief center for imports. For example, nearly all the tea and wine used in Great Britain enter through London. The great warehouses are filled with goods from all climes, such as flour, sugar, meat, tobacco, hides, and cocoanuts.

Being a very old city, many of the streets are narrow and crooked. On that account transportation of goods, and of people, is often slow and difficult. Some of the principal streets are too narrow for street cars, so that, unlike American cities, the people have to be carried through these streets mainly by omnibuses (Fig. 377). One of the largest companies formerly ran as many as thirteen hundred buses, and employed five thousand men and fifteen thousand horses. About a third of the omnibuses are now being run by electricity. As in New York and other American cities, underground railways have been built in various parts of the city, running under houses and streets.

(4) *Importance in other ways*

London is the capital of the *British Empire* (Fig. 381), which is the name given to the United Kingdom and its dependencies. It is a center for the publication of books and magazines, and is provided with noted picture galleries, libraries, museums, and magnificent buildings.

Its wealth and trade are so extensive that it has been the money center of the world, though New York, the money center of the United States, now rivals it. The leading bank, called the Bank of England, is the agent of the government in much of its business, and employs about a thousand persons.

(5) *Places of interest near London*

Just below the city, on the south side of the river, is the Greenwich Observatory (p. 203), from which meridians of longitude are numbered and time is regulated. A few miles up the Thames is Windsor Castle, one of the palaces of the sovereigns of the empire. Find CAMBRIDGE and OXFORD (Fig. 366), the two leading university towns of Great Britain.

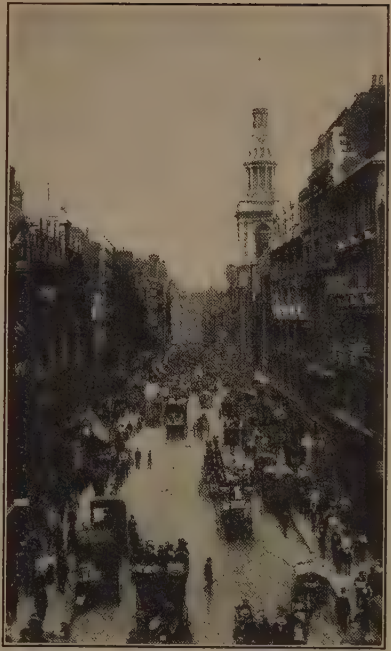


FIG. 377. — Omnibuses in one of the narrow London streets.

3. Other English cities

(1) *In the south of England*

Southwest of London, on the coast, is SOUTHAMPTON, where many ocean steamers from the United States stop (Fig. 375), and where fast trains wait to convey passengers to the metropolis. Close to Southampton is PORTSMOUTH, which has a great navy yard.

Almost due west of London, near the head of Bristol Channel, is BRISTOL, which is engaged in the lumber trade and in tobacco and chocolate manufacturing. It was formerly next to London in size, but Liverpool has now

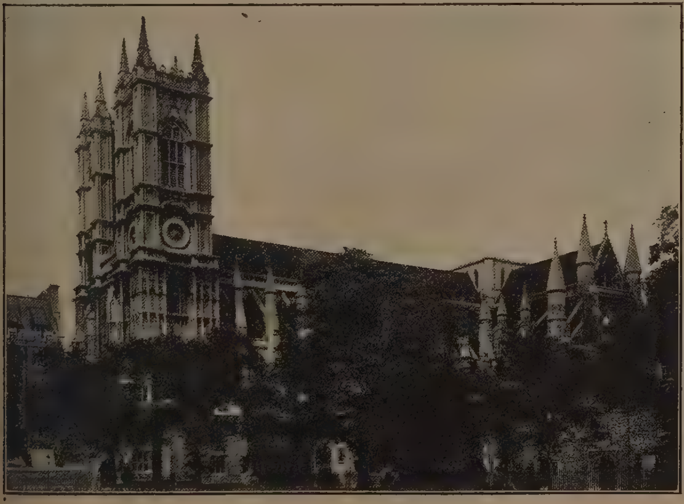


FIG. 378. — The famous Westminster Abbey in London.

far outstripped it. Can you suggest some reason why? Just west of Bristol is CARDIFF, in Wales, the chief British port for the export of coal.

(2) *In the north*

Knowing the occupation of the dense population in northern England, we can tell the principal exports of HULL and LIVERPOOL. What must they be? The former city naturally trades mainly with Europe, and the latter with the Americas and West Africa.

Before the discovery of the New World, the west side of Great Britain had little commerce, and LIVERPOOL (Fig. 375), therefore, had little business or growth. With the settlement of America, however, the city grew until it now has an immense trade with North and South America, and is the third city in size in the United Kingdom. Many passengers from America land at this port and go to London by rail. Besides its commerce, Liverpool is also important for its shipbuilding. Why is this a favorable place for such an industry? A ship canal, about thirty-five miles in length, has been built to MANCHESTER, at an expense of $75,000,000.

FIG. 379. — The city of Edinburgh.

4. Cities of Scotland

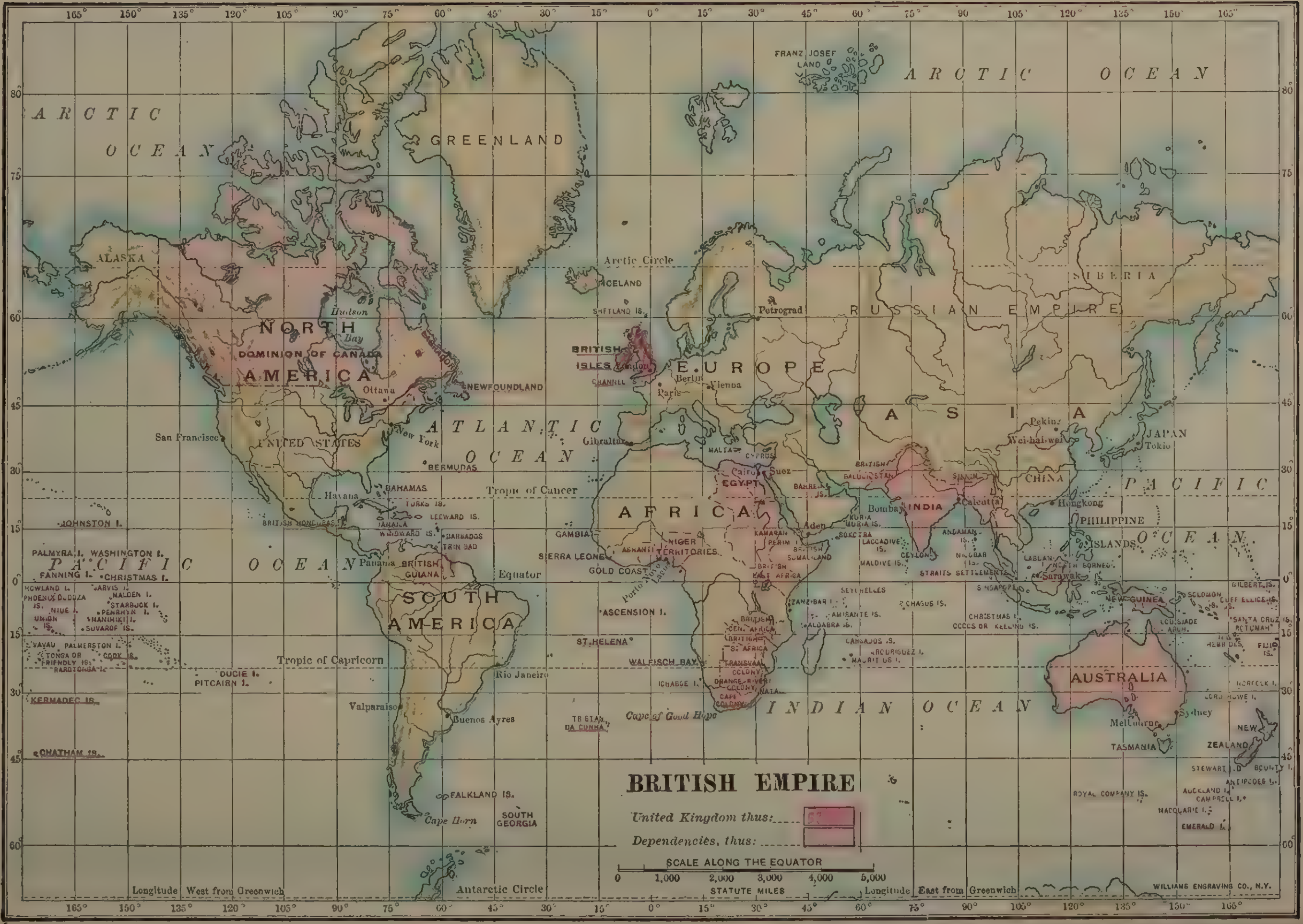
GLASGOW (Fig. 366), on the west side of the Lowlands of Scotland, is second to London in size among British cities. It is a leading manufacturing center and shipping point, for the same reasons that Liverpool is. State these reasons. What must be some of its principal imports and exports? Why?

EDINBURGH, unlike the other large cities named, is not very important either as a shipping point or as a manufacturing center. It is distinguished as the capital of Scotland, and as one of the most beautiful cities in the British Isles. In former days, before Glasgow developed commerce with America, Edinburgh was much more important than Glasgow; for it commanded the entrance to the Lowlands of Scotland. It still has important trade, and is a noted educational center. The well-known University of Edinburgh is situated here. LEITH, a short distance away, is the port for Edinburgh.

Farther north, on the coast, are DUNDEE and ABERDEEN (p. 267). The former sends forth a number of Arctic whaling vessels each year, and is also engaged in the manufacture of linen.

5. Cities of Ireland

The principal cities of Ireland are on the east and south sides. Why? What has already been said about BELFAST (p. 270)? It is also noted for its shipbuilding. DUBLIN, the capital of Ireland, and the chief port for the Eng-


BRITISH EMPIRE
United Kingdom thus:
Dependencies, thus:
SCALE ALONG THE EQUATOR
0
1,000
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4,000
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STATUTE MILES
Longitude West from Greenwich
Longitude East from Greenwich
WILLIAMS ENGRAVING CO., N.Y.
ARCTIC OCEAN
FRANZ JOSEF LAND
GREENLAND
ALASKA
NORTH AMERICA
DOMINION OF CANADA
Hudson Bay
Ottawa
NEWFOUNDLAND
UNITED STATES
San Francisco
New York
BERMUDAS
ATLANTIC OCEAN
Arctic Circle
ICELAND
SHETLAND IS.
BRITISH ISLES
London
CHANNEL
Paris
Berlin
Vienna
EUROPE
Petrograd
RUSSIAN EMPIRE
SIBERIA
ASIA
Gibraltar
MALTA
CYPRUS
Cairo
Suez
EGYPT
Tropic of Cancer
BAHAMAS
Havana
TURKS IS.
LEEWARD IS.
JAMAICA
WINDWARD IS.
BARBADOS
TRINIDAD
BRITISH HONDURAS
Panama
BRITISH GUIANA
Equator
SOUTH AMERICA
Tropic of Capricorn
Rio Janeiro
Valparaiso
Buenos Ayres
FALKLAND IS.
Cape Horn
SOUTH GEORGIA
Antarctic Circle
JOHNSTON I.
PALMYRA I.
WASHINGTON I.
PACIFIC OCEAN
FANNING I.
CHRISTMAS I.
HOWLAND I.
JARVIS I.
PHOENIX
DUDOZA IS.
MALDEN I.
NIUE I.
STARBUCK I.
UNION IS.
PENRHYN I.
MANIHIKI I.
SUVAROF IS.
VAVAU
PALMERSTON I.
TONGA OR FRIENDLY IS.
COOK IS.
RAROTONGA I.
DUCIE I.
PITCAIRN I.
KERMADEC IS.
CHATHAM IS.
AFRICA
GAMBIA
SIERRA LEONE
GOLD COAST
ASHANTI
NIGER TERRITORIES
Porto Novo
Lagos
ASCENSION I.
ST. HELENA
WALFISCH BAY
ICHABOE I.
TRISTAN DA CUNHA
Cape of Good Hope
KAMARAN
PERIM
BRITISH SOMALILAND
BRITISH EAST AFRICA
ZANZIBAR I.
BRITISH CEN. AFRICA
BRITISH S. AFRICA
TRANSVAAL
ORANGE RIVER COLONY
NATAL
CAPE COLONY
BAHREIN IS.
BRITISH BALUCHISTAN
Aden
KURIA MURIA IS.
SOKOTRA
Bombay
INDIA
Calcutta
SIAM
LACCADIVE IS.
MALDIVE IS.
CEYLON
ANDAMAN IS.
NICOBAR IS.
STRAITS SETTLEMENTS
SINGAPORE
SEYCHELLES
AMIRANTE IS.
ALDABRA IS.
CHAGOS IS.
CARGADOS IS.
RODRIGUEZ I.
MAURITIUS I.
CHRISTMAS I.
COCOS OR KEELING IS.
INDIAN OCEAN
Pekin
Wei-hai-wei
CHINA
Hongkong
JAPAN
Tokio
PHILIPPINE ISLANDS
LABUAN
NORTH BORNEO
Sarawak
NEW GUINEA
SOLOMON IS.
GILBERT IS.
ELLICE IS.
LOUISIADE ARCH.
SANTA CRUZ IS.
ROTUMAH
NEW HEBRIDES
FIJI IS.
AUSTRALIA
NORFOLK I.
LORD HOWE I.
Sydney
Melbourne
TASMANIA
NEW ZEALAND
STEWART I.
BOUNTY I.
ANTIPODES I.
ROYAL COMPANY IS.
AUCKLAND I.
CAMPBELL I.
MACQUARIE I.
EMERALD I.

FIG. 381.

lish trade, ships farm and other products to England and receives manufactured goods in return. QUEENSTOWN has a fine harbor, and is a port of call for vessels bound from America to Great Britain.

Fuller reasons for greatness of British Empire

While we have learned many facts about the British Isles, some important questions are not yet fully answered. For example, why does this little country possess more colonies (Fig. 381) than any other nation of the earth? Further, why should it have the greatest foreign trade? And why the greatest number of vessels upon the sea?

1. Why so many colonies

Some of the reasons in answer to these questions are as follows: The fact that Great Britain is so small — no point in the island being more than seventy miles from salt water — is a reason why many of the British have become sailors. It is not surprising, therefore, that they have been great explorers.

Nor is it to be wondered at that, as these explorers discovered new parts of the world, they laid claim to them in the name of their mother country. In this way, and by war, Great Britain came into possession of the Thirteen Colonies of North America, and of Canada, India, Australia, much of Africa, and many other places (Fig. 381). At present her territory includes about one fifth of the land surface of the globe, and one quarter of its inhabitants.

2. Why so great a foreign commerce

These colonies and dependencies help to explain Great Britain's enormous foreign commerce; for the colonies have found it more to their advantage to trade with the mother country than with other nations, which speak a different language and have less understanding of them or sympathy with them. The colonies sell raw products and food stuffs to the mother country, and she sends to them clothing, steel goods, and other manufactured articles. It is largely the exchange of goods with these colonies that has made the foreign trade of Great Britain nearly twice that of any other nation. Next to her colonies, Great Britain's greatest trade is with the United States.

FIG. 380. — A street scene in Dublin.

3. Why so many ships

Some of the reasons why this little island owns more vessels than any other nation have already appeared. In fishing, exploring, and making settlements, a large number of ships have been needed; and many war ships have been required for the proper defense of her widely scattered colonies. Another reason for so large a navy is the fact that the British Isles are cut off from all other nations by water. For defense, therefore, the British must rely upon war ships rather than upon a standing army.

Further than this, the British are actually *forced* to own many ships. Here are over forty-five million people living on two small islands, from whose soil it is impossible to obtain the necessary food. They must send ships away for their flour, meat, sugar, tea, coffee, etc.; and they must send abroad for much of their raw materials for manufacture. Also, in order to pay for the raw materials and food, their manufactured goods must be shipped to all parts of the world; otherwise such extensive manufacturing would be impossible. From this it is plain why a very large number of vessels must be employed; and there are two reasons why the British, rather than other nations, should own them. In the first place, such trade is profitable; and secondly, when they own their own vessels, they can send them where and when they will, and are, therefore, better able to secure food and supplies in case of war.

FIG. 382. — The House of Parliament in London, where the House of Lords and House of Commons meet.

These facts, coupled with the remarkable energy of the British, are the principal reasons why the United Kingdom greatly surpasses all other nations in number of war ships and merchant vessels.

Government of the United Kingdom

The government of the United Kingdom is a limited monarchy, the present ruler being King George V. We know that in the United States our general laws are made at Washington by a Congress composed of a Senate and a House of Representatives. In the United Kingdom the law-making body, which corresponds to our Congress, is called *Parliament*. It is likewise composed of two bodies, the House of Lords and the House of Commons.

The *House of Lords* is made up of members of the nobility, or men with inherited titles, who are not elected by the people. In former times the Lords were so powerful that the people had little control of the government; but for many generations the Lords have had much less power. The *House of Commons*, whose members are elected by popular vote, is now by far the more important. Through them the people are able to make their own laws, and the government is therefore one that allows great freedom.

The sovereign corresponds to our President; but the execution of laws is really in charge of a *Cabinet*, composed of a *Prime Minister* and several other *Ministers*, who are responsible to the House of Commons for their actions. If the Ministers lose the support of the House, they are obliged to resign; and then others are appointed who will carry out the wishes of the people.

Review Questions

1. What remarkable facts can you state about the position, size, and importance of these islands? 2. How does the character of the inhabitants help to explain the importance of the islands? 3. How is the importance of the islands also partly explained by the prevailing winds? 4. By the character of the surface of the land? 5. By the irregular coast line? 6. By the natural resources? 7. Tell about the raising of live stock on these islands. 8. What are the other leading farm products? 9. Of what importance is fishing? 10. What important minerals are found? 11. What conditions greatly favor manufacturing? 12. What can you tell about the woolen manufacturing? 13. Cotton manufacturing? 14. Iron and steel manufacturing? 15. How does Ireland compare with Great Britain in prominence of agriculture? What are the farm products of Ireland? 16. How does Ireland contrast with Great Britain in mining? 17. In manufacturing? Describe the chief manufacturing industry. 18. What about the population of Ireland? 19. Name and locate the principal cities of the British Isles. 20. Tell further about the location of London. 21. Its early history and present size. 22. Its manufacturing and commerce. 23. Its importance in other ways. 24. What places of interest are near London? 25. Locate and state the important facts about other cities in the south of England. 26. In

the north. 27. Tell about the leading cities of Scotland. 28. Of Ireland. 29. How has the British Empire come to have so many colonies? 30. So great a foreign commerce? 31. So great a navy and so many merchant vessels? 32. Describe the government of the British Isles.

Suggestions 1. Make a sketch map of Great Britain, showing the position of the highlands and lowlands, principal rivers and cities. 2. Considering the prevailing winds, which side of the great cities must be most free from smoke? 3. Why are sheep able to eat shorter grass than cattle? 4. Make a list of goods manufactured from flax, and place samples in the school cabinet. 5. Write a short paper telling in what ways the people of the British Isles and the United States depend on one another. 6. State ways in which New England and Great Britain resemble each other. 7. What names of British cities have you met in your study of the United States? In what portion of the United States are they? 8. Read in George Eliot's "Silas Marner" a description of old-fashioned manufacturing by hand looms. 9. Also in "John Halifax, Gentleman," an account of the introduction of steam into the factories. 10. What books written by Englishmen have you read? 11. What early English explorers took part in the exploration of North America?

III. THE NETHERLANDS, BELGIUM, AND LUXEMBURG (Fig. 416)

Map Study 1. Compare the area of The Netherlands with that of Belgium (p. 424); with that of Great Britain. 2. Compare the coast lines of The Netherlands and Belgium. 3. What large river crosses The Netherlands? Through what countries does it flow? 4. What countries border The Netherlands? 5. Belgium? 6. Make an outline map of these two countries.

1. The Netherlands (Holland)

Surface features Figure 383 shows The Netherlands to be a peculiar country. The greater portion is very low, and some parts are as much as fifteen feet below sea level. In fact, if protection against sea and river were not provided, about one half of the surface would be under water at least a part of the time. This explains why the country, sometimes called Holland, is more commonly known as *The Netherlands*, meaning *the low country*.

The Rhine has brought much of the soil; some of it, no doubt, all the way from the Alps. A large part of the country is, in fact, a delta of sand and clay built by the Rhine. It is so low and level that, over much of the surface, the only notable elevations are either sand dunes, thrown up by the wind, or glacial moraines of sand and gravel (p. 9). In Figure 363 notice how far the ice sheet advanced in this section. Hard rocks are found only in the extreme eastern and southeastern parts, where the highest point is a little over a thousand feet above the sea.

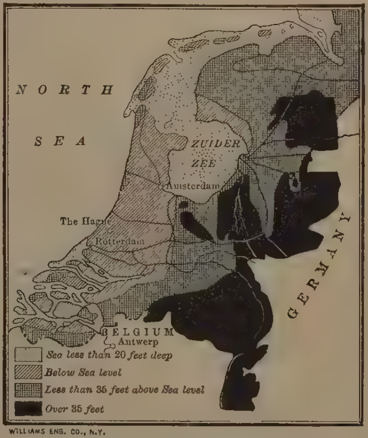


FIG. 383. — Map to show the portion of The Netherlands that is below sea level.

How the low-land has been reclaimed As the population increased, and there was need for more land, it was found possible by building embankments, called *dikes*, to keep the high tides and rivers from overflowing the salt marshes and flood plains. The people have even undertaken the difficult task of reclaiming the shallow sea bottom itself. Such drainage began in the twelfth century and has continued until the present day. It has already about doubled the area of The Netherlands, and now a scheme is projected by which the Zuider Zee is to be reclaimed.

The first step in reclaiming a section of land is to build dikes around it. Then the water is pumped from the inclosure and emptied into the rivers, or into the sea. Windmills were formerly the only means for such pumping, and many are still in use (Fig. 384); but now many steam pumps are also used. These pumps must be worked all the time in order to keep out the rain water, as well as that which soaks through the soil.

There are sixteen hundred miles of sea dikes, some of which are fully three hundred feet thick, and thirty feet high. Some idea of the need of such great walls may be gained by standing behind one of them during a storm and listening to the fierce beating of the ocean waves on the opposite side, several feet above one's head.

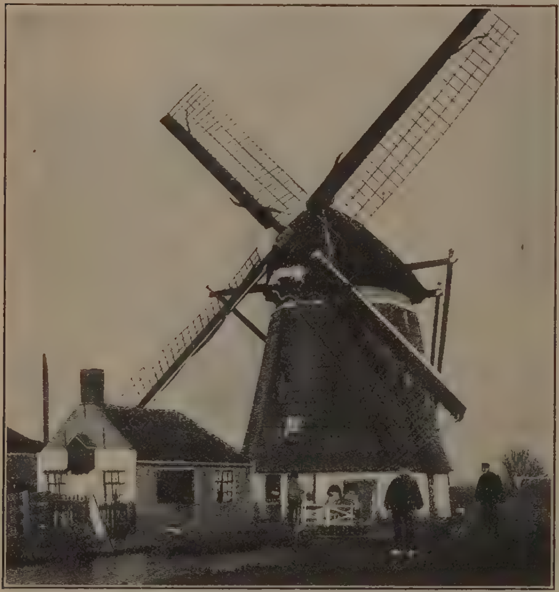


Fig. 384. — A Dutch windmill, used for pumping the water from the low lands behind the dikes.

The ditches for draining the land really form canals, which, by means of their embankments, inclose houses, gardens, and fields, much as fences or stone walls inclose houses and gardens in other countries. They are so numerous that they extend over the lowlands in a great network.

Number and character of the people

It might seem that a country so small as this, and with such a surface, could not support a large population. Nevertheless, The Netherlands has about two thirds as many inhabitants as the remarkably productive state of New York, which is four times as large. They are a very prosperous people, too.

Perhaps the leading cause for this prosperity is the excellent character of the *Dutch* people, as the Netherlanders are called. For centuries they have felt an intense love for civil and religious liberty; but, being a small nation, they have suffered many hardships in attempting to maintain such liberty. At one time they were under German control; later they came under the cruel rule of Spain; but finally they obtained their independence, and their form of government is now a limited monarchy.

While their efforts for freedom brought untold suffering to the Dutch people, it helped them, in one way, by causing people of advanced ideas to seek refuge among them. Thus it was to Holland that the Pilgrims first fled when religious persecution drove them from England; and from time to time large numbers of Huguenots, Germans, and other persecuted people found refuge there. Such people brought new ideas, and had a great influence on the intelligence with which Dutch industries were developed.

Agriculture

Agriculture is the principal industry of the Kingdom. The leading farm products are grains, such as rye, oats, wheat, barley, and buckwheat. Potatoes, sugar beets, beans, peas, and flax are also grown. There are many gardens, including flower gardens where bulbs are raised. The Dutch raise such excellent bulbs that they are sold all over the world.

More land is devoted to pasture (Fig. 385) than to all these crops. This is partly because much of the higher land is too sandy for cultivation, and partly because the moisture in the lowlands aids in the growth of excellent grass. Cattle, hogs, sheep, and horses are raised in great numbers; and quantities of butter and cheese are made.

Fishing

Both the Zuider Zee and the North Sea, near at hand, contain many food fish; and this fact has made fishing an important Dutch industry.

Mining and manufacturing

In so level a country there can be little water power; and little mineral wealth is to be expected in a land made up of soft clays and sands. A poor grade of iron ore is found in the bogs, and a little coal is mined in the extreme southeast.

Under the circumstances, one might not expect much manufacturing. Fortunately, however, there is an abundance of coal near by in Belgium, Germany, and England. And, since the Dutch people require quantities of cloth, shoes, machinery, etc., they import both coal and some of the raw materials in order to manufacture for themselves.

The strangers who fled to The Netherlands to escape persecution did much toward developing early manufacturing. Its growth has been further aided by the efforts of the Dutch to reclaim land from the sea. The windmills, with their inclosing buildings, were valuable not merely as houses, storehouses, and pumps, but also for the purpose of grinding grain and doing other kinds of work. Thus, lacking water power, the Dutch learned to make some use of *wind power*. Besides, in order to build the canals and dikes, and to drain the land, they needed implements, such as plows and pile drivers, and these they manufactured. Again, having an abundance of clay, and needing both bricks and tile in their drainage work, they developed manufacturing in these directions. Some of the Dutch pottery, known as Delft ware, is greatly prized for its beauty. In fact, manufacturing now ranks next to agriculture in importance here.

FIG. 385. — Cattle feeding in the rich pastures of Holland. A typical Dutch scene.

Reasons for extensive commerce

1. Easy transportation

Commerce is highly developed for several reasons. In the first place, the ditches, built for the purpose of drainage, are also useful as canals; and these, together with the rivers, make transportation by water very easy to all sections of the country. Furthermore, the flat-topped dikes make excellent wagon roads; and the level nature of the land renders the building of railways a simple matter.

2. Position of Holland

A second reason for the importance of commerce is the *position of Holland*. This country lies directly in the path of entrance to northern Europe; and it is crossed by the Rhine River, which is navigable for a long distance through Germany. Therefore, much of the American and British trade with central Europe is carried on through Holland.

The Dutch colonies (Fig. 417) furnish a

3. Its colonies

third reason for the extensive commerce. Since the very earliest times the Dutch have been in close contact with the salt water. Not only have they battled with the sea in reclaiming their land; but to visit some of their near neighbors they have been obliged to go by boat. The men have, therefore, become expert sailors; and when discoveries of new lands were being made, the Dutch sailors naturally took part. This, of course, was followed by the founding of colonies in distant lands.

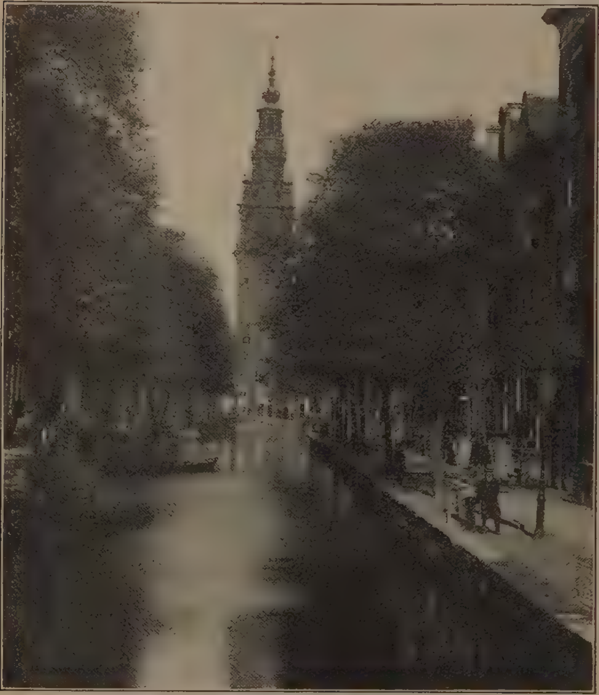


FIG. 386. — A canal in the city of Amsterdam.

The attempt of the Dutch to colonize our Hudson Valley was stopped by the English; but Holland retains possession of other important regions. Of these, Dutch Guiana in South America has already been mentioned (p. 248); but the most important Dutch colonies are Java and several other East India islands (Fig. 417). The manufacture of raw products obtained from the colonies forms one of the principal industries of the coast cities.

Cities

AMSTERDAM and ROTTERDAM are the two principal cities. The former, the largest city in The Netherlands, is about the size of Baltimore. It is connected with the ocean by canal, and is noted for its university and museums, as well as for its shipping, manufacturing, and diamond cutting. The rulers of Holland are crowned at Amsterdam, although the royal family resides at THE HAGUE, where the government buildings are situated.

ROTTERDAM, next to Amsterdam in size, is the chief seaport of The Netherlands. Its location, near the mouth of the Rhine, makes it one of the principal ports for entrance to the interior of the continent. This explains why Rotterdam is the European terminus for some of the important steamship lines from New York and other parts of the world.

2. Belgium (Fig. 416)

Comparison of surface with that of Holland

In much of Belgium the surface of the land reminds us of Holland. The country is low and flat in the northern and western parts, but gradually rises, and grows more rolling toward the south and east. There is much more of this hilly land in Belgium, and the highest point (2230 feet) is more than twice that in The Netherlands.

Number and character of the people

Although Belgium is even smaller than Holland, its population is much larger, or over seven million. How does that compare with the population of New York State? Little

Belgium is, in fact, the most densely populated country on the earth.

Like the Dutch, the Belgians have endured untold sufferings in their long struggle for independence. Their country has been, from time to time, a battlefield for the larger countries, or *Powers*, of Europe; for example, the *Battle of Waterloo*, by which the career of Napoleon Bonaparte was ended, was fought here in 1815.

Belgium, together with parts of France and The Netherlands, once formed the country of *Flanders*, and nearly half the Belgian people still speak the *Flemish* language. Since 1830, Belgium has been an independent country, and the present form of government is a limited monarchy.

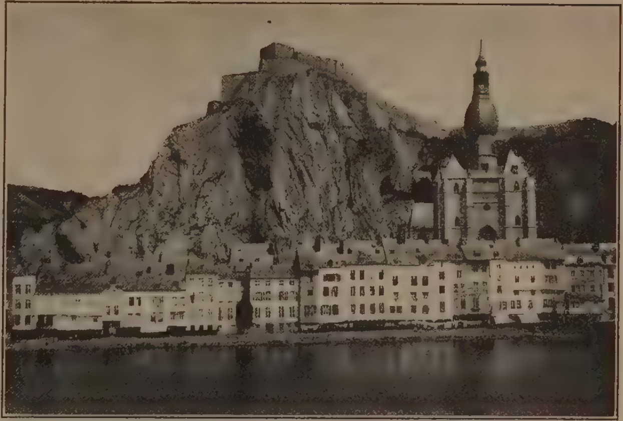


FIG. 387. — A view in the hilly southern portion of Belgium.

The intelligence of the Belgians is of the highest order. Even during the Middle Ages their woolen manufactures were the best in Europe; and at various times the kings of England induced Flemish artisans to move to England for the purpose of improving the manufacturing there. Once the Great Powers of Europe declared Belgium neutral territory, thus prohibiting further fighting there. The Belgians, like the people of Luxemburg, have not been able to maintain their neutrality. They devoted themselves to the industries. As a result, Belgium has enjoyed a wonderful growth in times of peace.

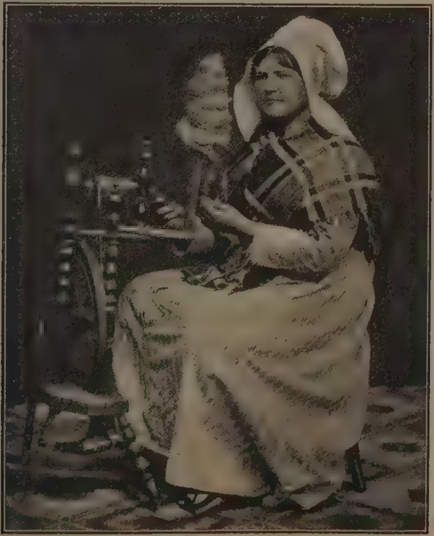


FIG. 388. — A Belgian woman working at the spinning wheel. There is much of this hand work in Belgium.

Agriculture

More than half the inhabitants are engaged in agriculture, the chief products, besides live stock, being grain, flax, hemp, fruit, and sugar beets. Among the farm animals, the Flemish horses are especially noted for their great size and strength.

The Belgian method of farming forms a striking contrast to that in the United States. Instead of farms with from one hundred to several thousand acres, as in our country, the Belgian farms usually contain not more than two or three acres. To a large extent, spading takes the place of plowing; and such hand labor, guided by the experience of many generations, secures large crops of the best quality. In spite of such careful cultivation of the soil, however, there are so many people in Belgium that much food has to be imported.

Mining and manufacturing

Quite different from the level northern plain, close set with farms and towns, is the hilly region of the southern angle, covered with forests. The weathering of ages, which has worn these mountains so low, has brought to light valuable mineral deposits, especially coal and iron ore. As in England, these two minerals occur near together. Lead, zinc, and silver are also found here; and there is much quarrying of marble and other building stones.

Belgium, therefore, possesses advantages for agriculture similar to those of Holland, while the minerals give far greater opportunity for manufacturing. These facts help to explain why the population is so dense. More than one hundred thousand men are engaged in mining, and coal and coke are among the leading exports of the kingdom.

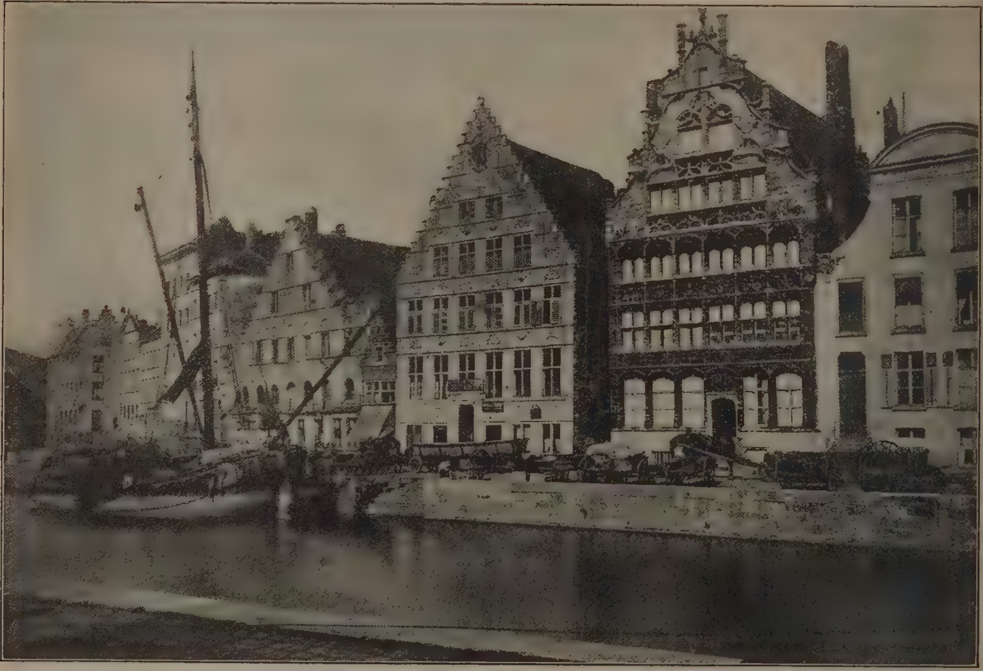


Fig. 389. — Some of the quaint houses of Ghent facing one of the canals on the low plain of northern Belgium.

The northwest slope of the hilly region is one of the world's busiest industrial regions. As in England, the three most important kinds of manufacturing are cotton, wool, and iron and steel. Linen and glass are also made. The country is so small, and there are so many water ways and railways, that coal is transported cheaply to all sections. Manufacturing, therefore, is well distributed over the kingdom, although coal is found only in the south.

Commerce

By its position Belgium secures many of the advantages that Holland enjoys; that is, it is a gateway to and from the interior of Europe. To be sure, its coast line is only about forty miles in length and the water there is shallow; but ANTWERP has an excellent harbor on the broad lower course of the small Scheldt River.

There is no large river, like the Rhine in Holland, but two smaller streams, rising in France, are navigable for some distance across the plain. There is also an extensive system of canals. Besides these water ways, Belgium has more miles of railway, for its size, than any other country. For these reasons transportation of goods is one of the leading industries.

The Belgians do not possess such valuable colonies as the Dutch, but they have been prominent in African exploration. It was the Belgian king who sent Stanley to Africa, and the Belgian Congo is now a Belgian colony.

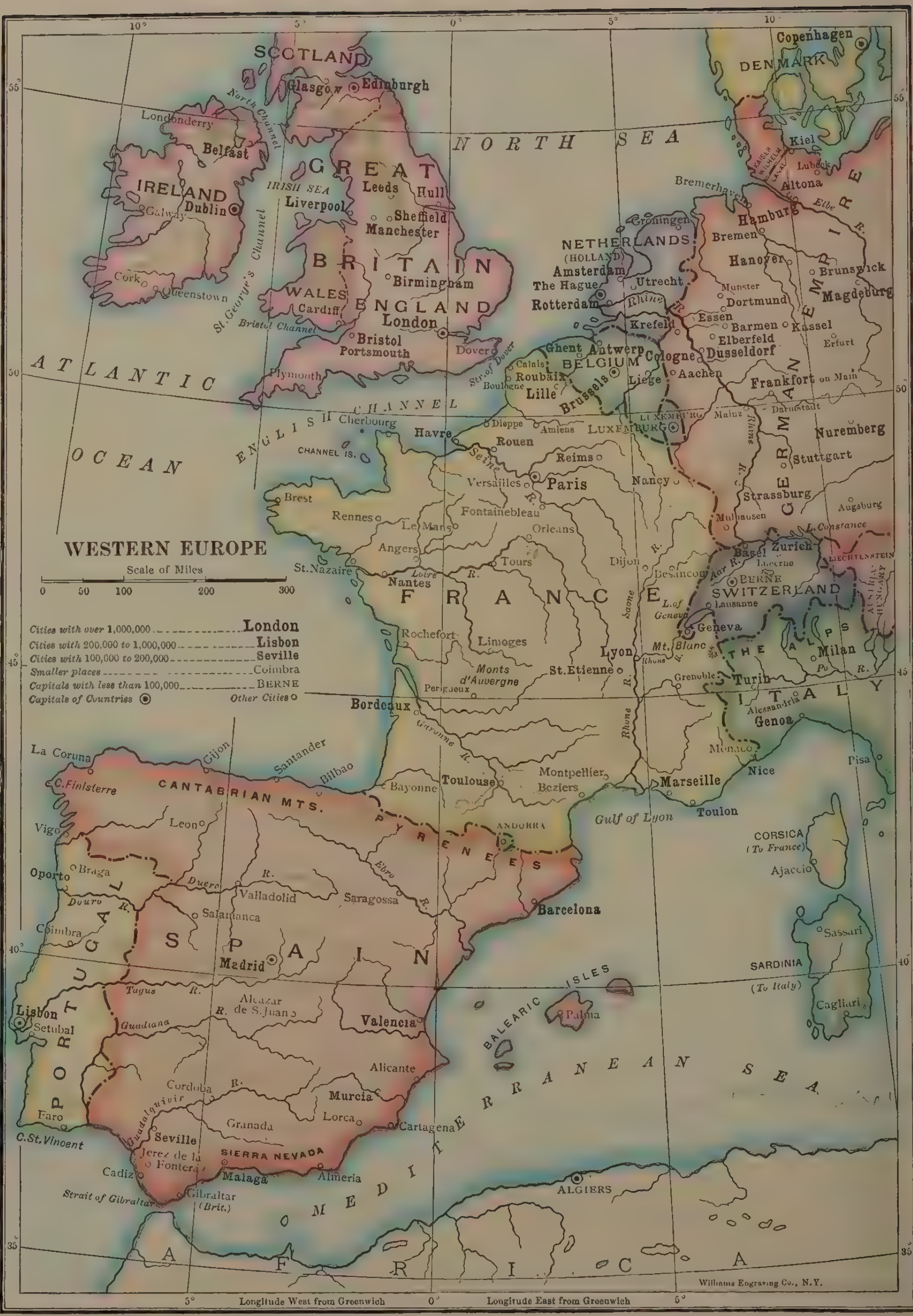

WESTERN EUROPE
Scale of Miles
0 50 100 200 300
Cities with over 1,000,000 London
Cities with 200,000 to 1,000,000 Lisbon
Cities with 100,000 to 200,000 Seville
Smaller places Coimbra
Capitals with less than 100,000 BERNE
Capitals of Countries
Other Cities
SCOTLAND
Glasgow
Edinburgh
North Channel
Londonderry
Belfast
IRELAND
Dublin
Galway
Cork
Queenstown
St. George's Channel
IRISH SEA
GREAT BRITAIN
Liverpool
Leeds
Hull
Sheffield
Manchester
WALES
Cardiff
Birmingham
ENGLAND
London
Bristol Channel
Bristol
Portsmouth
Plymouth
Dover
Str. of Dover
NORTH SEA
ATLANTIC OCEAN
ENGLISH CHANNEL
CHANNEL IS.
Cherbourg
DENMARK
Copenhagen
Kiel
KAISER WILHELM CANAL
Lubeck
Altona
Elbe R.
Bremerhaven
Hamburg
Bremen
Hanover
Brunswick
Magdeburg
GERMAN EMPIRE
Groningen
NETHERLANDS (HOLLAND)
Amsterdam
The Hague
Utrecht
Rotterdam
Rhine R.
Munster
Dortmund
Essen
Barmen
Kassel
Elberfeld
Erfurt
Krefeld
Dusseldorf
Cologne
Aachen
Ghent
Antwerp
BELGIUM
Brussels
Liege
Calais
Roubaix
Boulogne
Lille
Frankfort on Main
Mainz
Darmstadt
LUXEMBURG
Nuremberg
Rhine R.
Stuttgart
Strassburg
Augsburg
Mulhausen
L. Constance
Dieppe
Amiens
Havre
Rouen
Seine R.
Reims
Paris
Versailles
Nancy
Brest
Rennes
Le Mans
Fontainebleau
Orleans
Angers
Tours
Dijon
Besancon
St. Nazaire
Nantes
Loire R.
FRANCE
Saone R.
Rochefort
Limoges
Lyon
Monts d'Auvergne
St. Etienne
Perigueux
Bordeaux
Garonne R.
Rhone R.
Grenoble
Bayonne
Toulouse
Montpellier
Beziers
Marseille
Toulon
Gulf of Lyon
Basel
Zurich
Lucerne
Aar R.
LIECHTENSTEIN
BERNE
SWITZERLAND
Lausanne
L. of Geneva
Geneva
Mt. Blanc
AUSTRIA-HUNGARY
THE ALPS
Milan
Po R.
Turin
ITALY
Alessandria
Genoa
Monaco
Nice
Pisa
CORSICA (To France)
Ajaccio
SARDINIA (To Italy)
Sassari
Cagliari
La Coruna
C. Finisterre
Gijon
Santander
Bilbao
CANTABRIAN MTS.
PYRENEES
ANDORRA
Vigo
Leon
Oporto
Braga
Duero R.
Douro R.
Valladolid
Ebro R.
Saragossa
Barcelona
Salamanca
Coimbra
PORTUGAL
SPAIN
Madrid
Tagus R.
Alcazar de S. Juan
Lisbon
Setubal
Guadiana R.
Valencia
BALEARIC ISLES
Palma
Alicante
Cordoba
Guadalquivir R.
Murcia
Lorca
Granada
Cartagena
Faro
C. St. Vincent
Seville
Jerez de la Frontera
SIERRA NEVADA
Cadiz
Malaga
Almeria
Strait of Gibraltar
Gibraltar (Brit.)
MEDITERRANEAN SEA
ALGIERS
AFRICA
10° 5° 0° 5° 10°
55° 50° 45° 40° 35°
Longitude West from Greenwich
Longitude East from Greenwich
Williams Engraving Co., N.Y.

FIG. 390.

Cities

Brussels, the capital and largest city, is situated in the heart of the kingdom. The name *Brussels carpets* suggests one of its industries; but carriage and lace making are at present among its most important kinds of manufacture. Brussels is an educational as well as a political and commercial center, having numerous picture galleries, museums, and schools.

Antwerp, next in size, is some distance inland on the navigable Scheldt River. Some of the great steamship lines from New York have their European terminus here, and the port is one of the most important in Europe. The leading kinds of manufacturing are sugar refining, distilling, lacemaking, and shipbuilding.

Many other cities and towns are important manufacturing centers. The largest are Liège, the "Birmingham of Belgium," engaged in the manufacture of firearms, cutlery, glass, and various kinds of machinery; and Ghent (Fig. 389), noted for linen and cotton goods, and for machinery.

3. Luxemburg

On the southeastern border of Belgium is the small duchy of Luxemburg, governed by an hereditary grand duchess and a Parliament. Like Belgium, by agreement of the Great Powers of Europe, it was until 1914 neutral territory. Agriculture, iron mining, and manufacturing are the principal industries.

Review Questions

The Netherlands. 1. Describe the surface of Holland. 2. How has the lowland been reclaimed? 3. What about the number and character of the people? 4. Tell what you can about the agriculture; about fishing. 5. What about mining? 6. Account for the importance of manufacturing. 7. What reasons can you give for the extensive commerce of Holland? 8. Name and locate the principal cities.

Belgium. 9. Compare the surface of Belgium with that of Holland. 10. What about the number and character of the Belgian people? What kind of government have they now? 11. What is the condition of agriculture? 12. Of mining and manufacturing? 13. Of commerce? 14. Locate and state important facts about the cities. 15. Tell about Luxemburg.

Suggestions

The Netherlands. 1. Why are the winds likely to blow with special force and regularity across Holland? 2. Why is this fact of special value to the Dutch? 3. Find out more about the flower gardens of the Dutch. 4. Have you seen any Dutch pottery, especially Delft wares? 5. Find out why the Pilgrims did not remain in Holland instead of coming to America. 6. Why should not Rotterdam be as large a city as New York? 7. Find out about the Peace Conferences of 1899 and 1907 at The Hague. 8. What reasons are there for selecting a small country like Holland for such a conference, and for making treaties between nations which have been at war?

Belgium. 9. There are greater extremes of temperature in Belgium than in England. Why? 10. Find out some facts about the battle of Waterloo. 11. Give several reasons for spading instead of plowing land. 12. Examine a piece of lace. From what material is lace made, and how is the work done? 13. Towns in Belgium are often known by two names. Why? 14. Figure out the number of persons per square mile (see Appendix, p. 424) in Belgium and compare it with the number in New York, or in your own state.

IV. FRANCE

Map Study

1. France is the nearest country to the British Isles. Estimate the distance between the two. 2. Compare the two countries as to area. 3. As to population. 4. What countries border France? 5. What waters? 6. In what respects is its position favorable to commerce? 7. What do you observe about the general direction of the rivers? Name them. Locate the island of Corsica, which belongs to France.

People and government

The early inhabitants of France, called Gauls, were conquered by the Romans, who gave them their language and many of their customs.

After the fall of Rome, France was divided into independent kingdoms, which were often at war with one another or with neighboring countries. The natural boundaries of France have, however, tended to bring these kingdoms together; for the country is inclosed on two sides by the sea, and elsewhere, in large part, by mountains. Notice how completely the Pyrenees separate France and Spain; and what a barrier the lofty Alps form along the Italian and Swiss borders. Even north of the Alps, a part of the boundary is formed by highlands (Fig. 360).

While the inhabitants were thus partly protected from invasion, there were few barriers within France itself to keep the people of different sections apart. It was not difficult, therefore, to bring the several kingdoms under one rule.

Monaco in the southeast, and *Andorra* in the Pyrenees (p. 291), are the only exceptions. The principality of Monaco, only eight square miles in area, is a noted winter resort because of its fine climate.

France has changed its form of government several times. For a long time it was a monarchy, and over a century ago it became a republic; but this did not continue long, for Napoleon Bonaparte became so powerful that he was made emperor. There have been other changes since then, the last one being in 1871, when the republican form of government was again established.

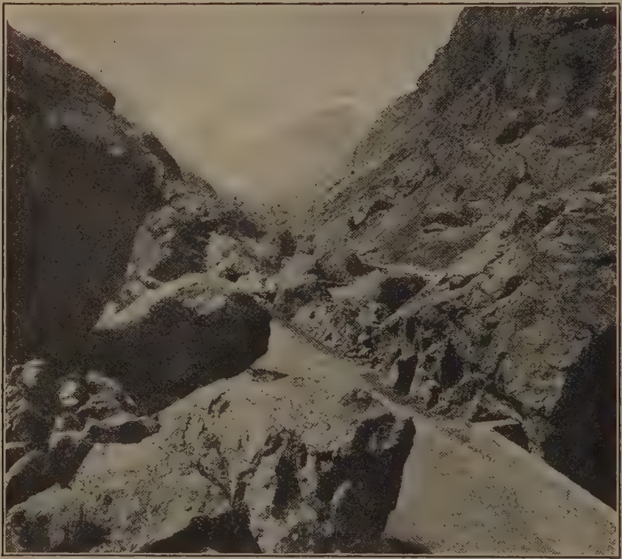


FIG. 391. — A road across the rugged Pyrenees which lie between France and Spain.

Surface features and rainfall

As we have seen, the chief highlands of France are in the south and southeast. Among these the loftiest are the Alps, whose highest peak, Mont Blanc (15,781 feet), is in France. Since there are no mountains in the western part of the country, the west winds are able to bear vapor to all parts of France, thus supplying all sections with an abundance of rain for agriculture.

The position of the highlands is favorable to commerce as well as to farming. Fully three fourths of France is a plain, sloping westward from the low central plateau. All but one of the large rivers rise in this plateau, and flow gently across the plain to the Atlantic. Thus navigation is possible far into the country. Locate and name the four largest rivers. How does the Rhone differ from the other three?

Temperature

As might be expected, the summers are warmer than in England, since France lies almost entirely south of that country, and is less under the influence of the ocean. The southeastern section, although it lies as far north as Boston, has a semi-tropical climate (Fig. 392). This is because of the warm Mediterranean waters, and the protection from cold north winds afforded by the mountains (pp. 262 and 283).

Agriculture

1. Crops

With so favorable a climate, and so much level land, France has naturally become a farming country. Nearly half the people are engaged in agriculture. The same grains are raised as in England. What are they (p. 265)? Wheat is the most important, and more of this grain is produced than in any other European country excepting Russia. Yet France raises only about half as much wheat as the United States, and not nearly enough for the needs of her people.

Grapes, not important in the British Isles, thrive in the warmer climate of central and southern France. This fruit is the most valuable of all French crops, and more grapes are grown in France than in any other country except Italy. In the Rhone Valley, and on the warm Mediterranean coast, there are groves of olive, orange, and mulberry trees. The leaves of the latter furnish food for the silkworm (p. 286).

2. Live stock

As in England and other countries, the highlands are unsuited to cultivation, and are in large part given over to grazing. As in England, too, there are broad tracts of lowland that are used for pasture. These facts explain why there are more than fourteen million cattle and eighteen million sheep in France.

Mining

France is inferior to the British Isles in mineral products. Coal is the most valuable mineral; but while Great Britain, after supplying her many factories, has a large amount of coal left for export, France has to import some. The principal coal beds lie close to Belgium. They are, in fact, a continuation of the coal deposits of that country. Small coal beds are found at other points, as near St. Etienne.

A small quantity of iron is produced, mainly in the northeast near the coal fields. Fine clays for porcelain are found in central France, and building stones are quarried in many places.

Manufacturing
1. Why very extensive

In spite of the limited supply of fuel, France is a great manufacturing nation. It ranks fifth in the production of silk, second in the production of wine, and there is extensive manufacturing of metal, cotton, and woolen goods. One reason for these manufactures is the fact that coal is easily obtained, either in France or from Belgium, Germany, and England.

Another reason is found in the nature of the people themselves. Frenchmen have a peculiar appreciation of what is graceful, delicate, and elegant. This is illustrated by the fact that so many of our fashions in dress come from France; and a gown, a pair of gloves, or a hat from Paris is expected to be a trifle more desirable than one bought elsewhere. On this account the French have given much attention to the manufacturing of the finer kinds of goods. Thus their artistic taste has had great influence upon both the kind and amount of their manufacturing.

Fig. 392. — A view in Nice showing the semi-tropical foliage of southern France.

2. Leading kinds
(1) ***Woolen and cotton manufacturing***

The northern part of France, including Lille, Roubaix, and Reims, as well as cities near the mouth of the Seine, is the section especially noted for the woolen industry. Here coal is most easily obtained; and large numbers of sheep are raised on the hills and plains near by, while foreign wool from Argentina and Australia is easily imported at HAVRE and at the Belgian port of Antwerp. Remembering that the hosiery, carpets, underclothing, and other goods are of high grade, and such as wealthy people wish, we see that this location, between the two wealthiest capitals of the world, is especially favorable. Next to silk goods, woolen cloths form the most important French export to Great Britain.

There is also much cotton manufacturing near the coal fields of northern France. An important reason for such work in this section is the ease with which American cotton may be imported; and this explains why ROUEN, on the Seine, is a center for cotton goods. There are cotton factories in eastern France, also, where water power is used instead of steam power. Why should you expect water power in that section?

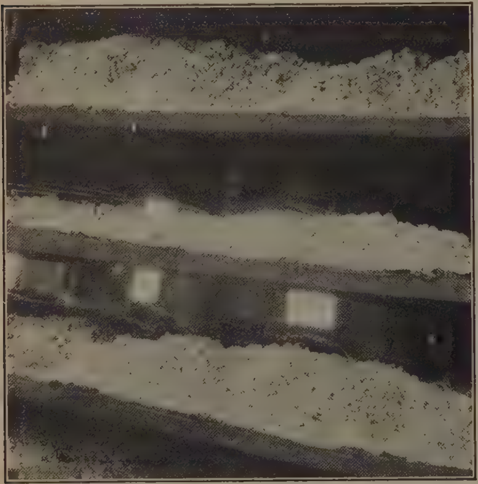


FIG. 393. — Piles of silkworm cocoons ready to be unwound.

(2) *Silk manufacturing*

Because the climate and soil of the Rhone Valley are favorable to the growth of the mulberry tree, and because coal mines are near by, this section is a great silk-manufacturing region. LYON is the center, but ST. ETIENNE and PARIS are also noted for this industry. Some of this manufacturing is done in large factories, some in the homes of the workmen where hand and foot power are used in place of steam.

The traveler in the Rhone Valley sees grove after grove of mulberry trees, carefully tended in order to supply an abundance of leaves for the silkworm to eat in summer. The silkworm moth, at the end of the caterpillar stage, weaves a cocoon about itself. The material of which the cocoon is composed is a thread, about two miles in length, which must be carefully unwound. The single thread is so very fine that, in order to make a fiber strong enough for spinning and weaving, it must first be united with several others.

Since the worms are reared under cover, the silk industry may be carried on in any climate in which the mulberry tree will grow. It is possible, therefore, to produce raw silk in many parts of the world; but the feeding of the worms, and the changing of the cocoons into silk for the market, require much labor, care, and skill. On that account silk production is chiefly confined to those parts of the world where laborers will accept low wages, and where, because several generations of people have done this work, habits of watchfulness and care have been developed. China, accordingly, produces the greatest amount of raw silk; but France, in the midst of Europe, where the market for silk goods is greatest, also produces a large quantity and is the leading country for the manufacture of silk. Make as long a list of articles made from silk as you can.

(3) *Other manufacturing*

The extensive cultivation of grapes has been mentioned. Great quantities of grapes are made into wine for export or for use in France. In that country nearly every one drinks wine at his meals, or wine mixed with water.

The manufacture of steel goods is important in some places, but to no such extent as in Great Britain. Other kinds of manufacturing are mentioned under the cities.

Principal cities

1. Paris

PARIS, the capital of France, is the largest city on the continent of Europe, and the third largest in the world. It numbers more than 2,840,000 inhabitants.

(1) *Importance of its location*

Paris is situated on the Seine at a point where there is a small island in the river. This island was once a good place for defense, and also an important aid in bridging the river

(Fig. 394). The location is especially favorable to the growth of a large city, for several reasons. The Seine, having a slower current than the Rhone, and being less subject to overflows than the Loire, is more easily navigable than any other river in France. Its upper tributaries, too, bring Paris into close touch with eastern France; and, by the aid of canals, there is water connection with the Loire and Saone also, and with the Rhine in Germany. Furthermore, Paris is situated on the main trade route from the Mediterranean to northern and central France, which follows the Rhone, the Saone, and the Seine. Finally, Paris is located in the midst of the most fertile portion of the country, and not very far from several other densely populated countries. For all these reasons it has always been the principal French city.

(2) *Its importance as an art center*

Reference has already been made to the artistic taste of the French. Napoleon and other rulers collected art treasures from various nations, and founded museums and schools which have made Paris famous. This explains why large numbers of Americans go to Paris every year to study art.

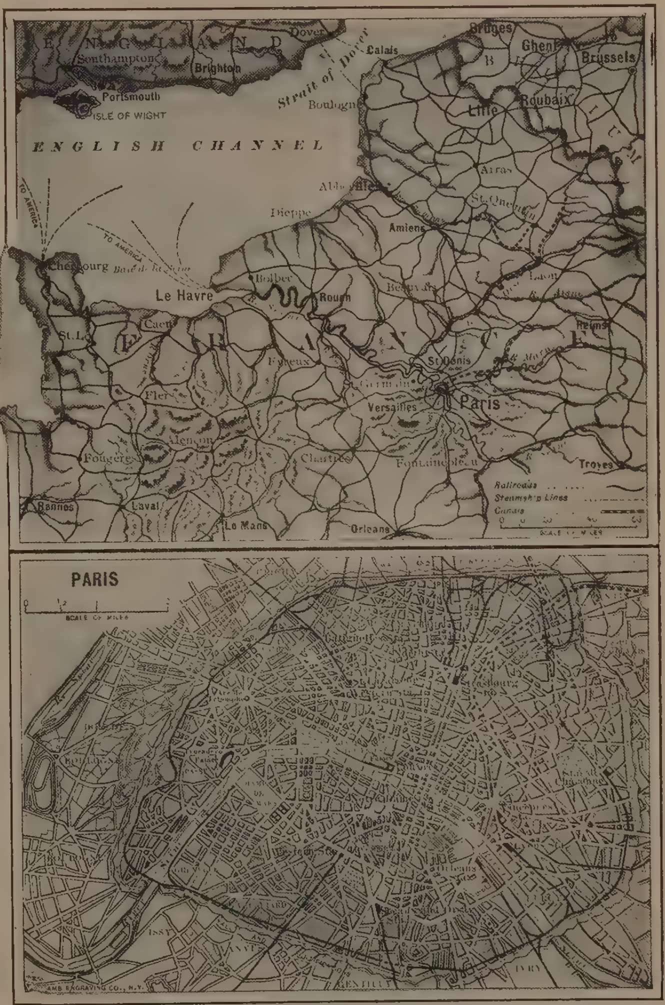


FIG. 394. — To show Paris and surrounding country. Notice how closely the railways follow the stream valleys. Why should they?

One of the old palaces, known as the *Louvre*, is the most noted art gallery in the world. It contains thousands of works of art, the most celebrated of all being the marble statue called the Venus of Milo. Among the paintings, one of the most famous is Raphael's "Madonna and Child with St. John," copies of which are often seen in our homes.

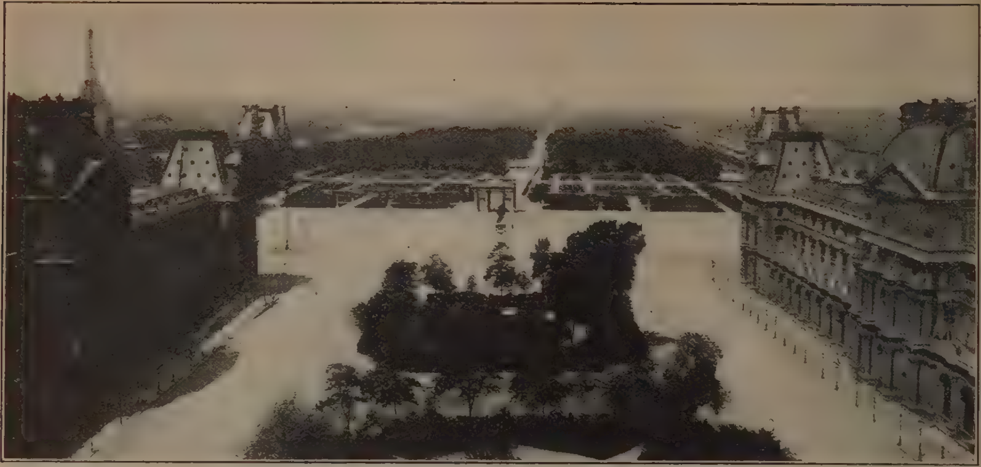


FIG. 395. — A view in Paris showing the broad streets and parks.

Among the many interesting suburbs of Paris is VERSAILLES, where there is another palace that was erected in the days of royalty. It is now used mainly as a museum, and scores of the large rooms are decorated with the finest of paintings. It is among such treasures that the students of art spend much of their time.

It is not strange, therefore, that Paris should be noted, the world over, for its beauty as a city (Fig. 395). The wide streets, the beautiful parks with their fountains and statues, and the fine public buildings and old royal palaces are wonderfully attractive. Even the dwelling houses are in good taste, for it is required by law that new buildings be so planned as to be in keeping with those near by. Therefore one seldom sees an unattractive building in Paris.

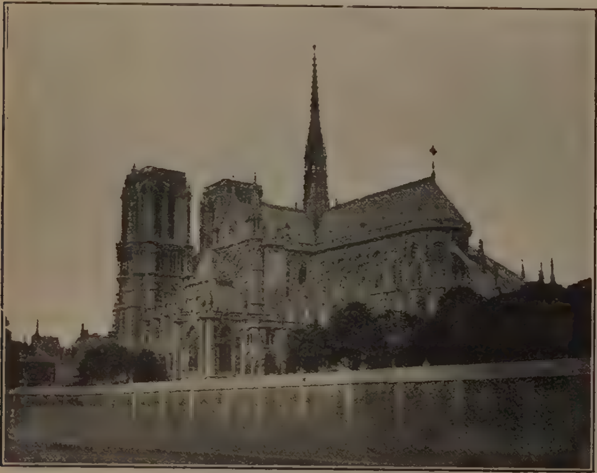


FIG. 396. — Notre Dame Cathedral, one of the most famous buildings in Paris. General view from the river.

(3) *Its manufactures*

Like other great cities, Paris has many manufacturing industries. The superior taste of the Parisians has led them to pay especial attention to the manufacture of articles which combine usefulness with beauty, such as jewelry, furniture, gloves, and fashionable shoes. The Sèvres porcelain is made in the suburbs of Paris; and both this and the Limoges ware, manufactured at LIMOGES, are celebrated for their beauty.

(4) *Its commerce*

Although so far inland, Paris ships more goods by water than any other French city. The extensive system of canals, by which the country is crossed in all directions, has already been mentioned (p. 287). Vast sums have been spent in dredging the lower Seine, so that the depth of water between Rouen and Paris now exceeds ten feet. Small vessels can proceed directly to Paris; but larger ships transfer their goods to trains, or smaller boats, at HAVRE and ROUEN. Railway transportation is also well provided for, since the chief railways of France radiate in all directions from Paris (Fig. 394). Altogether, therefore, Paris is the political, artistic, manufacturing, and commercial center of France.

2. Other cities
(1) *Havre, Boulogne, and Calais*

HAVRE, which is almost as busy a port as Marseille, has an extensive trade in coffee from Brazil, and in wheat and other materials from the United States. Farther to the northeast is BOULOGNE, where some of the American steamships stop; and not far distant is CALAIS, the nearest port to England, where boats cross the Strait of Dover to England.

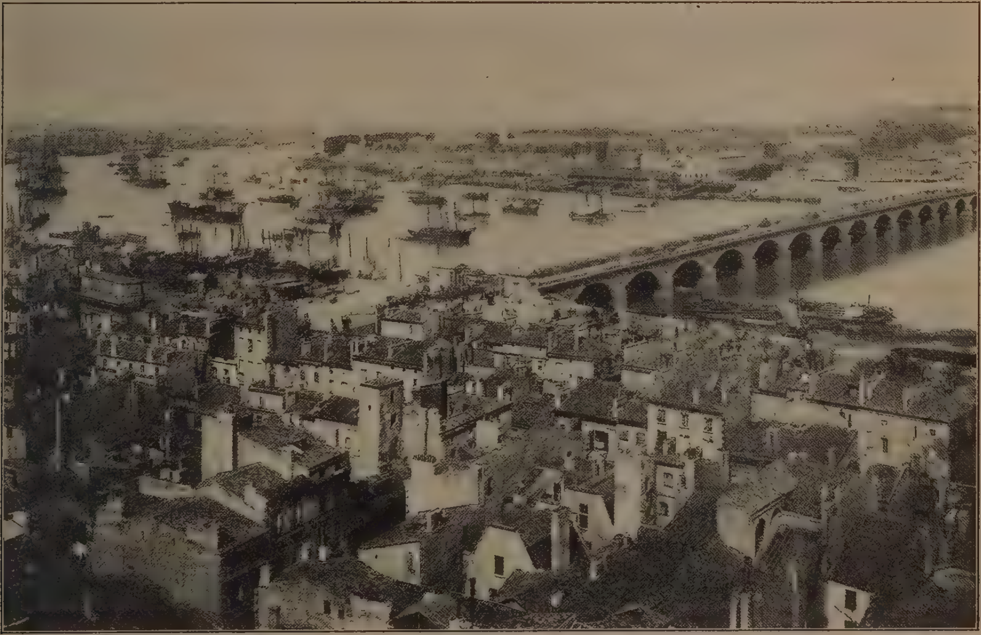


FIG. 397. — A part of Bordeaux and the Garonne River.

(2) *Bordeaux and Lyon*

BORDEAUX, on the Garonne River (Fig. 397), in the midst of a fertile grape-raising district, is the chief port for the export of French wines. Locate the cities previously named (pp. 285 and 286), and tell for what each is important. Note especially LYON, the center of the silk industry of France.

(3) *Marseille*

The leading seaport of France on the Mediterranean is MARSEILLE, located near the mouth of the Rhone. The delta of the Rhone is too marshy for a city, and Marseille occupies the nearest point where there is a good harbor and high ground. For many centuries the Rhone Valley was the principal gateway from the Mediterranean to central Europe, and it is natural, therefore, that a city should grow near the mouth of the Rhone River. One route leads to the Seine Valley, and thence to Paris (p. 287), northern France, and Belgium. Another ancient route of travel enters Switzerland past Lake Geneva, out of which the Rhone flows; and still a third route leads, through an opening in the mountains, into the Rhine Valley and Germany.

Weakness of France as a naval power, with reasons

In spite of the great amount of internal commerce on the numerous rivers, canals, and railways, and in spite of the extensive foreign trade, France is not a great naval power like the United Kingdom. In fact, France has only one nineteenth as much tonnage as Great Britain, and only nine tenths as much as Norway.

This is not entirely because of lack of acquaintance with the sea, for there are many French fishing and merchant ships. The small number of good harbors, and the frequent and destructive wars during the last century, are among the reasons why France depends so largely upon other nations, such as Great Britain and Norway, for vessels to carry her goods. Why is it safer for France than for Great Britain to be thus dependent?

French colonies

On the other hand, France has taken a leading part in the exploration and settlement of new lands. You will remember that the French formerly had extensive possessions in North America. Where were they? Where are her present colonies in the New World (Fig. 417)?

In Asia, France holds a part of Indo-China and a very small bit of India; and she owns numerous islands in different portions of the world (Fig. 417). Her most important colonies at present are in Africa, as follows: (1) Algeria and Tunis, across the Mediterranean; (2) a vast area south of these countries, including a large part of the Sahara Desert, the Sudan, the upper Niger, and the country north of the Congo River; and (3) the large island of Madagascar, east of southern Africa.

Review Questions

1. What can you tell about the people and government of France? 2. Locate Monaco and Andorra. 3. Describe the surface of France; the climate. 4. What about agriculture there? 5. Mining? 6. Why is manufacturing extensive, in spite of lack of fuel? 7. Tell about the woolen and cotton manufacturing. 8. Silk manufacturing. 9. Other manufacturing. 10. Explain the importance of the location of Paris. 11. Show how Paris is important as an art center. 12. As a manufacturing center. 13. What about its commerce? 14. Locate and state the important facts about other cities in France. 15. What about the weakness of France as a naval power? 16. Name and locate the principal colonies of France.

Suggestions

1. What is the name of the president of France? 2. Give reasons why one river, such as the Loire, might be much more subject to overflows than another, such as the Seine. 3. Examine Figure 363 to see if the glacier reached into any part of France during the Glacial Period. 4. Raise a silkworm from the egg. 5. Examine a cocoon, and see if you can unravel some of its thread. 6. Also unravel a piece of silk goods and examine the threads. 7. What influence have the railway tunnels through the Alps probably had upon the commerce of Marseille? 8. The Suez Canal? Why? 9. See if you can find any Sèvres or Limoges ware. 10. Draw an outline of France, with the principal mountains, rivers, and cities.

V. Spain and Portugal (Fig. 390)

Map Study

1. What cities in the New World are in about the same latitude as Madrid (Fig. 390)? 2. Compare the area of the Spanish peninsula with that of France (Appendix, p. 424). 3. Compare the populations (Appendix, p. 424). 4. Compare the directions taken by the rivers (Fig. 359). 5. Judging from the map (Fig. 390), what about the probable number of good harbors? 6. What has been stated about the temperature and rainfall in Spain (p. 262)? 7. What islands in the Mediterranean Sea belong to Spain?

Reasons for the decline of these countries

The people of this peninsula once had much the same rank among nations as is now held by the British. Name countries that they controlled. Now, however, both Spain and Portugal are classed among the weaker nations of Europe.

One cause for this decline is the backwardness of the people. The mountainous character of the peninsula is another. The various races on the peninsula, cut off from one another by table-lands and mountain ranges, have never been firmly united into one nation with common interests. For centuries they were divided into small, independent kingdoms, but just before the discovery of America, most of these states were brought under one rule; and later even Portugal was joined to Spain.

Portugal, which is partly separated from Spain by deep gorges and canyons, soon broke away. *Andorra*, a tiny country in the Pyrenees, was never fully conquered, and is still independent; and the union of some of the others has been by force rather than by choice. At present Spain is a limited monarchy; but in 1910 Portugal drove the king away and became a republic.

The highlands

1. Their extent

Many of the important facts about Spain and Portugal are explained by the elevation of the land. On the northern boundary stand the Pyrenees (Fig. 391), continued on the west by the Cantabrian Mountains, while in the extreme south are the lofty Sierra Nevada ranges (Fig. 359). Between these two mountain systems is a broad plateau, two or three thousand feet above sea level, broken by numerous short mountain ranges (Fig. 360).

In the Ebro Valley on the northeast, and the Guadalquivir (meaning Great River) Valley on the southwest, there are lowlands. Point to these rivers on the map (Fig. 390). The only other extensive lowland is a narrow strip near the sea, which reaches most of the distance around the peninsula. A very large portion of the surface, therefore, is made up of plateaus and mountains.

2. Their influence on climate

The highlands have an important influence on the climate. Owing to the elevation of the land, the interior has cold winters, though the summers are hot; and because of the fringe of mountains, the rainfall is light everywhere except near the northwestern coast. Here the ocean winds lose their moisture in rising over the slopes, and thus cause abundant rainfall (Fig. 365). The southern portion of Spain, like southern California, is in the horse latitudes (p. 209); and here the climate is so arid that irrigation is necessary for agriculture.

3. Their influence on commerce

The position of the Spanish peninsula, between the two busiest seas of the world, and between Africa and central Europe, suggests that it might be a natural route for commerce between the two continents. But the highlands *separate*, rather than unite, these regions, so that the Spanish peninsula has never been a great thoroughfare for the transportation of goods.

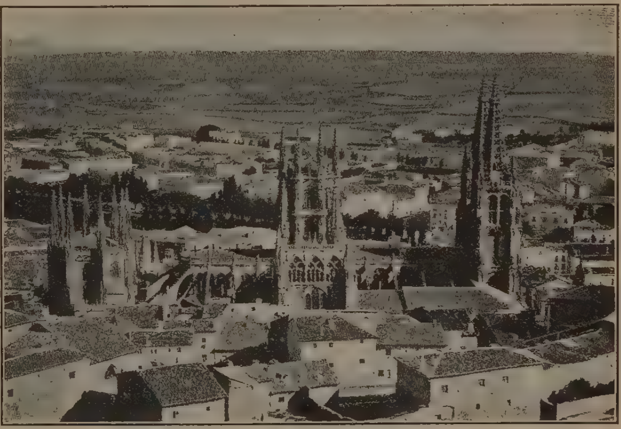


Fig. 398. — A village on the plateau of Spain.

There are several other important effects of the highlands. In the first place, the rivers are not navigable; for in descending from the arid plateau their courses are rapid and their volume slight. Besides that, most of them have cut such deep, narrow valleys, like our Western canyons, that they are useless for irrigation and are even a hindrance to travel. The principal exception is the Guadalquivir, which has a wide valley, and up which vessels are able to go as far as SEVILLE.

Since the interior is so arid and rugged, Spain has little forest, little agriculture, few roads, railways, and canals, and not a dense population. With a few exceptions, therefore, the chief towns are to be found along the coast.

In one respect the elevation of the land is an advantage because it causes great variety of climate, and hence many kinds of farm products. What countries of South America does this condition call to mind?

Agriculture

1. Grazing

In such a country we may expect grazing in the uplands and along the mountains; and Spain is, in fact, noted for the excellent grade of its sheep and mules. There are also many cattle, especially in the rainy northwest; but the fact that so much of the country is arid explains why there are many more sheep and goats than cattle.

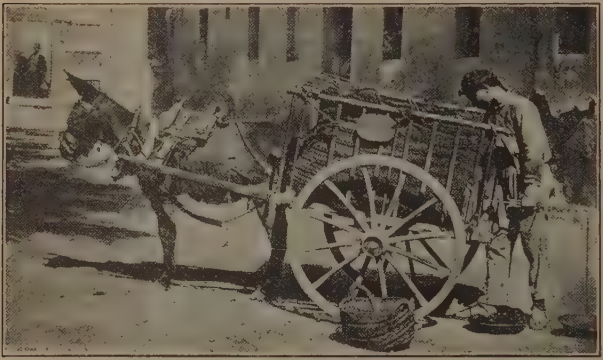


Fig. 399. — A Spanish peasant bringing vegetables to market in his donkey cart.

The sheep often wander about in large flocks, sometimes as many as ten thousand together, under the care of a number of shepherds and their dogs. In summer they feed among the mountains, but in winter they are driven down to the more protected lowlands for shelter.

2. Farming

Wheat is the most common farm crop in Spain, since it requires little rain; but many of the farmers are so unprogressive that less wheat is raised than might be. In many of the valleys, where irrigation is possible, and on the lowlands along the coast, the farmers are more progressive and prosperous. Barley, rye, and corn are grown, in addition to wheat, and these are among the staple foods of the people. Quantities of grapes are also raised in Spain and Portugal; and in the southern part of the peninsula the bark of the cork oak is a source of income to both countries.

The arid southeastern coast is wonderfully productive. One reason for this is the warm climate, due to the Mediterranean (p. 262); another is the number of mountain streams, which, though useless for navigation, are very valuable for irrigation. Some of the products of this section, besides wheat and corn, are cotton, grapes, olives, figs, dates, oranges, lemons, and rice. Several crops of some products may be raised in a year.

Mining

The Spanish peninsula is remarkably rich in minerals, lead, silver, copper, and *quicksilver*, or mercury, being among the most important. Spain produces more quicksilver than any other country, and is exceeded only by the United States in the output of copper and lead. Coal and iron ore are also found in several parts of the peninsula, but the coal is of no great value. The iron, which is mainly found on the northern slope of the Cantabrian Mountains, occurs in large beds, and is very valuable.

In mining, as in other industries, the unprogressive character of the people prevents proper development of the resources. Much of the benefit from the mines is due to the capital and enterprise of foreigners rather than to the Spaniards.

Manufacturing

From what has been said above, it is plain that manufacturing does not flourish. This fact is all the more evident when we consider that more than two thirds of the Spaniards and three fourths of the Portuguese cannot read. A nation so backward can hardly be expected to have developed extensive manufacturing. Thus, although they have some coal and could easily import more, much of their iron ore is shipped to the coal fields of

Great Britain instead of being smelted at home. In some places, however, as will be seen in our study of the cities, there is extensive manufacturing.

Principal cities of Spain

1. Madrid and vicinity

MADRID, the capital and metropolis of Spain, has over a half million inhabitants; but unlike most other large cities so far studied, it is not an important manufacturing center. The reasons for its size are its central location, and the fact that it is the seat of the government. All the principal railway lines crossing the peninsula, to connect the coastal cities, converge at this point.

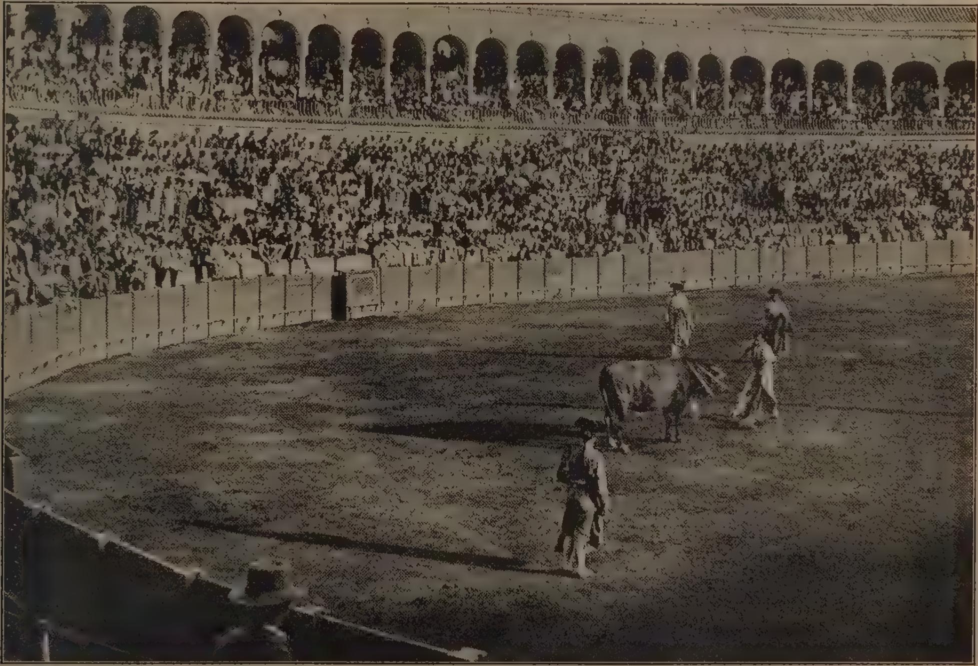


FIG. 400. — A bull fight watched by thousands of spectators.

Madrid, with its wide streets, magnificent royal palace, and one of the finest art galleries in the world, is in some respects a very attractive city. The surrounding country, however, is far from attractive; for from the streets of Madrid one looks across the country for miles and miles, seeing not a tree, nor fence, nor house; only the weeds and scattered vegetation of an arid waste. One of the most frequented places in Madrid is an enormous building with seats for many thousands, in which bull fighting takes place (Fig. 400). This brutal sport is enjoyed by most of the Spaniards as a baseball or football game is in our country.

2. Granada

Another place of note among the highlands of Spain is GRANADA, the last stronghold of the Moors, who invaded Spain, from Africa, centuries ago. To this point among the mountains, at the crossing of the best routes of travel, from east to west, and from north to south, the Moorish people withdrew. Here they were able to hold out against the Spaniards for two hundred years, and the city grew to a population of four hundred thousand. At present, Granada contains less than one fifth as many inhabitants, and its principal attraction is the Moorish palace, or *Alham-*

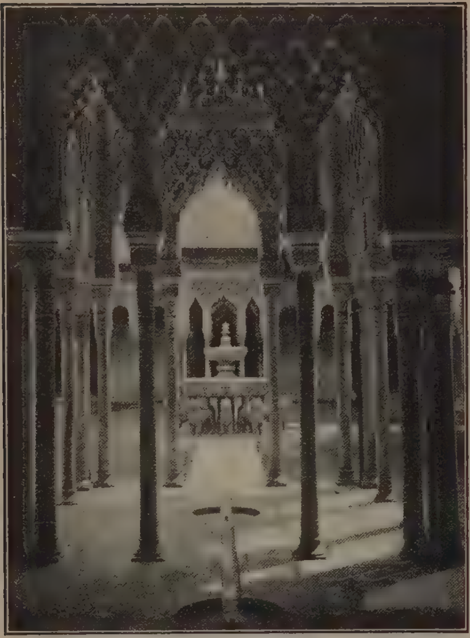


Fig. 401.—The Court of Lions in the Alhambra.

bra (Fig. 401), one of the finest examples of Moorish architecture.

3. Other cities in southern Spain

On the lowlands west of Granada are SEVILLE and CADIZ, both flourishing cities in former days, when vast stores of plunder were brought from Spanish colonies in the New World. CADIZ is now a fortified naval harbor; and SEVILLE is recovering some of her former commercial importance. It has some manufacturing, especially of tobacco; and in one factory about five thousand women are employed in making cigars and cigarettes.

MALAGA, which has one of the warmest climates in Europe, is engaged in the shipment of wine, raisins, and grapes. Of what grape does the name remind you?

4. Gibraltar

Gibraltar, a steep hill, with bold cliffs rising on nearly all sides, and with a town at its base, has belonged to England since 1704. This hill of solid rock (Fig. 402) is, perhaps, the strongest fortification in the world, and guards the entrance to the Mediterranean. Why should the English especially want such a stronghold here?

5. Principal seaports

On the whole, Spain is poorly provided with harbors; and while the majority of the people dwell near the coast, they take a small share in foreign commerce. BARCELONA and VALENCIA are the leading seaports. BARCELONA, the second Spanish city in size, is the more important port and is a textile manufacturing center as well. The region about Valencia is a beautiful garden, much like that around Los Angeles in southern

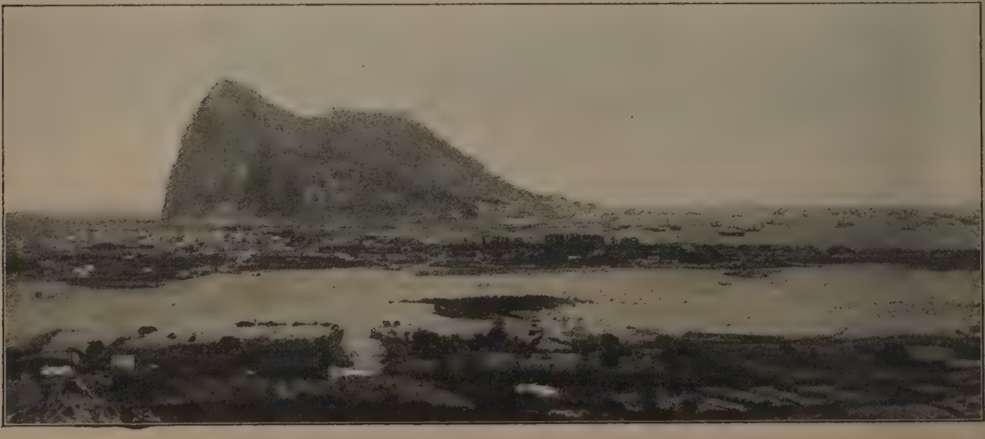


Fig. 402.—The rock of Gibraltar, seen from the Spanish mainland.

California. The two sections are quite alike both in climate and products. Name some of these products (p. 131). In addition to the products of southern California, rice is grown on the lowlands near the coast.

Colonies of Spain

The only remnants of her vast foreign possessions now left to Spain are mainly in Africa. These include a few small settlements on the coast of Morocco; a portion of the western coast of Sahara, having little value; and a coastal strip and a few small islands in the Gulf of Guinea. The Canary Islands, west of the northern coast of Africa, and the Balearic Isles, in the Mediterranean, also belong to Spain.

Principal cities of Portugal

LISBON and OPORTO are the chief cities of Portugal. The former, the capital and metropolis, is a very beautiful city. It lies on a broad bay where the Tagus River enters the sea, and has one of the finest harbors in existence. OPORTO gives the name to port wine. The lower part of the Douro Valley is one of the richest wine districts in Europe; and Oporto is an important point for its export.

Colonies of Portugal

Portugal, like Spain, has lost much of her foreign territory. The Azores Islands, far to the west in the Atlantic, and the Madeira Islands, to the southwest, are a part of the kingdom. The Cape Verde Islands, off the west coast of Africa, are also dependencies. In addition, Portugal has large possessions in Africa, and some small ones in Asia.

Review Questions

1. What was the former rank of these countries? State reasons for their decline. 2. State the extent of the highlands. 3. What influence have the highlands on the climate? 4. How do the horse latitudes affect the climate? 5. Explain the influence of the highlands on commerce. 6. State the main facts about the grazing. 7. Name the farm products. 8. What minerals are found? 9. Why is manufacturing of so little importance? 10. State facts about Madrid and vicinity. 11. About Granada. 12. Locate and state the important facts about other cities in southern Spain. 13. For what is Gibraltar important? 14. Tell about the principal seaports of Spain. 15. Name and locate the colonies of Spain. 16. Locate the principal cities of Portugal, and tell for what each is important. 17. What colonies has Portugal?

Suggestions

1. About what portion of the boundary line between Spain and Portugal is formed by rivers? 2. What must be the influence of railways upon the old-fashioned methods of farming in the interior of Spain? 3. Look in the report of the United States Census to see what per cent of our population cannot read. 4. Learn what is meant by the Pillars of Hercules. 5. Find pictures of Moorish architecture. 6. Read Washington Irving's "The Alhambra." 7. Make a sketch of the Spanish peninsula, including the principal mountains, rivers, and cities.

VI. NORWAY, SWEDEN, AND DENMARK (Fig. 358)

Map Study

1. The Scandinavian Peninsula is the largest in Europe. What is its length in degrees (Fig. 358)? In miles? 2. How does its western coast remind you of the western coast of Scotland and Ireland? 3. What proofs do you see of glacial action? Where? 4. What do you observe about the rivers of Sweden? 5. Which of these three countries has the largest population? 6. How does it compare with New York State in area and population? With your own state? (See Appendix, pp. 424 and 425.) 7. What points in North America have about the same latitude as Christiania and Stockholm? 8. On Figure 312 find how near to Scandinavia the west wind drift reaches. 9. Locate Denmark; point out the islands that form a part of the country. 10. At the entrance to what sea does Denmark lie?

People
1. Their relation to one another

These three countries have long been more or less united. The reason for this is that the best settled parts are close together and not separated by any important barrier. Most of the inhabitants of Norway and Sweden live in the southern part of the Scandinavian Peninsula, with no natural barrier between them; and only a narrow, shallow sea separates Scandinavia from Denmark (Fig. 416).

The people of the three countries are descended from a common stock, and at times have had a single government, though now independent of each other. Therefore they have many interests in common. The written language of the Norwegians and Danes is still the same, and, until recently, Norway and Sweden were united under one king. At present each country is a limited monarchy.

These people have been closely connected

2. Their relation to us

with our own history, for they made some of the early invasions and settlements in Great Britain, and thus are to be numbered among our ancestors. Their daring seamen reached Greenland, by way of Iceland, and discovered America nearly five hundred years before Columbus visited it. During the last century they have migrated to the United States by thousands, and have chosen homes in many states.

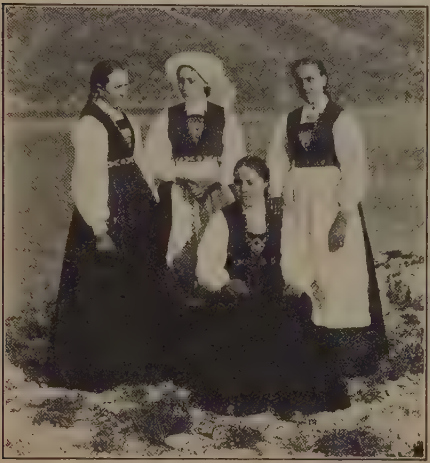


FIG. 403. — Peasants of Norway in their native dress.

Some reasons for the independence of these countries

In these three countries together there are only about one fourth as many inhabitants as in the much smaller British Isles. Yet in spite of frequent European wars, they have remained independent through many centuries.

1. Their position

This has been possible, in part, because of their peculiar position. The only approach to Scandinavia by land is through Lapland in Russia, which is so far north that it has a very cold climate. Thus the peninsula is almost as isolated from other nations as is Great Britain.

The peninsula of Denmark, on the other hand, is partly connected with Germany (Fig. 416). However, the islands, which are the most important parts of Denmark, are completely cut off from neighboring lands. Standing, as it does, at the entrance to the Baltic Sea, Denmark guards the approaches to this inland sea. Both Germany and Russia have long coveted little Denmark on this account. But since neither of them has been willing that any other Great Power should hold it, Denmark has remained free. Thus the very importance of its position has protected it.

2. Their rugged surface and severe climate

The rugged surface and severe climate of Scandinavia have likewise protected it from invaders. From its southern to its northern end, the peninsula is mountainous, for it is an ancient mountain land (p. 257), much worn, and crossed by deep valleys. Some peaks reach an elevation of six to eight thousand feet; but most of them are lower and rise to nearly the same height, giving to the upland the appearance of a plateau. The mountains descend steeply into the ocean on the western side, so that, in all but the southern part, Norway is a narrow, mountainous country crossed by short streams flowing in deep, steep-sided valleys. The boundary between northern Norway and Sweden follows the divide between the east- and west-flowing streams.

Although Denmark has no mountains, much of the land is sandy and barren. That all three of the countries have a severe climate is shown by the fact that even Denmark, the most southerly, lies about as far north as Scotland.

The agricultural districts

The west winds that blow from over the warm ocean exert a great influence here, as in the British Isles. Most of Norway, however, is too rugged and cold for farming. Out of a total area of about one hundred and twenty-four thousand square miles, less than four thousand have a soil and climate suitable to agriculture or pasturage. Sweden has much more low land, because the slope on the east side of the mountains is much the longer. Yet these lowlands are so far north, and so cut off by the mountains from the influence of the sea, that agriculture is of little importance anywhere except in the southern half of the country.

The northern and western portion of the Danish peninsula, called Jutland, is a sandy waste. Therefore only the islands and the southeastern part of Jutland are very productive. As a result of these conditions, the amount of land suitable for agriculture in the three countries is very small. The best sections are near together in southern Norway and Sweden and in eastern Denmark.

Industries and cities of Norway

1. The less important industries

Since Norway has so little land that is suited to farming or pasturage, the amount of stock and grain produced is small. Therefore, much meat, flour, and other food must be imported. There are some silver and copper mines, but coal is entirely lacking. Manufacturing, therefore, is not greatly developed. Even the fine water power is little used, because raw products for manufacturing are not abundant.

2. The three leading industries

On what, then, do the two million Norwegians depend for a living? They have two very valuable resources, — lumber and fish. More than one fifth of the country is forest-covered, pine being the most common tree. As in Maine, the rapidly flowing rivers are of use in moving the logs from the forest, and also in supplying power for the sawmills and planing mills. Lumber, wooden goods, and paper are the most important exports of the country.

Fish abound on the shallow banks along the irregular western coast, especially codfish in the neighborhood of the far northern Lofoden Islands. The North Sea, with its many fish, is also close at hand, and the Arctic Ocean with its seals and whales. Over a hundred thousand Norwegians are engaged in the fishing industry. Along the fiords every family owns a boat, and knows how to make one as well as how to use it. While the men are at sea, the women work the small farms or garden patches.

Centuries of experience in navigating the deep fiords, and in fishing, have bred in these people a love for the sea, which has given rise to a third great industry, — that of carrying goods for other nations. The timber for wooden vessels is easily supplied, so that they can be cheaply built. At present this small Norwegian nation has a greater *number* of freight vessels than any other European country except the United Kingdom.

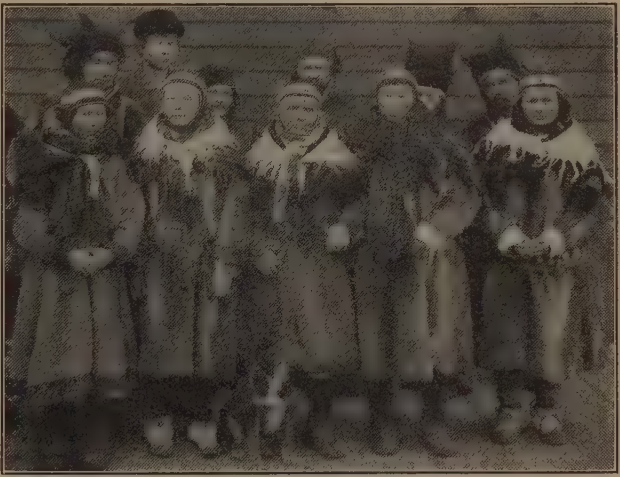


Fig. 404. — Laplanders who live, mainly by fishing, in northern Norway.

3. Cities

All these facts together explain why the Norwegian towns lie along the coast. Indeed, it is rare to find even a village in the rugged interior. CHRISTIANIA, the capital and largest city, is situated at the head of a long, narrow bay, which makes an excellent harbor. This city is the principal seaport and dis-

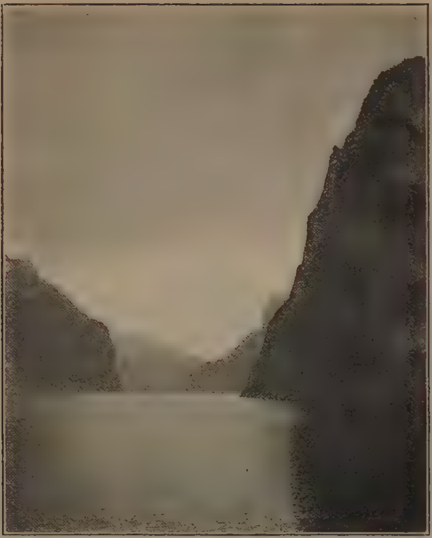


FIG. 405. — A view in one of the grand fiords of Norway.

tributing center for southern Norway. BERGEN, the next city in size, is an important fishing port, like Aberdeen in Scotland, and Gloucester in Massachusetts.

Scenery on the western coast

A sinking of the Scandinavian peninsula has caused the sea to enter the deep mountain valleys, forming many bays, peninsulas, and islands. It is estimated that there are fully ten thousand islands along the coast of Norway; and there are hundreds of bays and peninsulas.

The long, narrow bays, inclosed in steep mountain walls, are called *fiords* (Fig. 405). Some of these extend fully ninety miles inland. The cliffs are often only barren rock; but here and there, where the slopes are not too steep, green forests cover the surface. Glaciers are frequently in sight; and waterfalls abound on every hand. In some places the swollen streams from the mountains plunge downward for a thousand feet or more, over the nearly vertical cliffs which bound the fiords. Here and there, upon a level patch, a hamlet of fishermen's homes is seen. These hamlets are usually upon the deltas of small streams and are connected with the outer world, and with other villages, by no road or pathway except the waters of the fiord. So isolated are these hamlets that each man must learn to do many things, — farm, fish, tan his leather, make his shoes, build his boat, his house, etc.

Every summer hundreds of visitors, from all parts of the world, travel by steamer along this coast to enjoy the beautiful scenery. Another attraction is the sight of the sun at midnight (Fig. 406). At Bergen, Christiania, and Stockholm, which are in nearly the same latitude, the shortest night is less than six hours; at Trondhjem it is about four; and at Hammerfest (Fig. 358), north of the Arctic Circle, and near North Cape, the sun does not set from May 13 to July 29.

Industries of Sweden

1. Agriculture

Agriculture is the leading industry of Sweden. Here, fertile soil, swept from the highlands by the glacier (Fig. 363), has been scattered over the lower lands. This gives to the southern part of the country much the same appearance as New England presents. Oats are raised in greatest abundance, but rye, barley, wheat, and potatoes are also produced. In addition, much live stock is raised, and butter is exported.

2. Lumbering

A large part of the land that is too barren and rocky for farming supports a growth of timber. Nearly one half the area of Sweden is

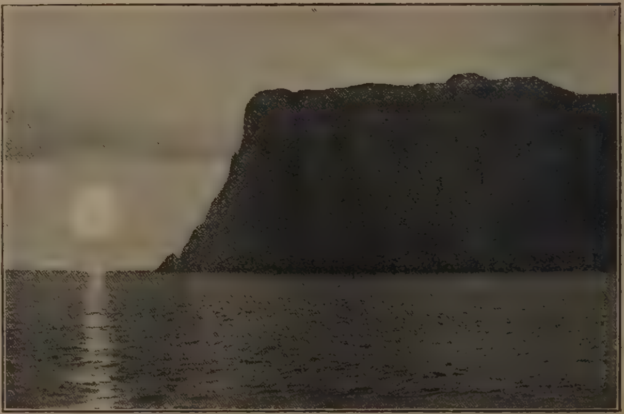


FIG. 406. — The midnight sun at North Cape, the northmost point in Norway.

covered with forest, and lumber is the principal export, as in Norway. Indeed, these two countries supply much of the lumber used in western Europe.

3. Mining and manufacturing

Mining is the third important industry. There are silver and copper mines; and a small amount of poor coal is found in the south. Sweden has long been noted for its iron ore, but since there is no good coal for smelting it, there is little iron manufacturing. However, some of the iron ore is smelted by the use of charcoal, and some by the use of coal brought from other countries. The Swedish iron is of such excellent quality that much of it is shipped to Sheffield, in England, for use in the manufacture of the highest grade of steel tools.

Sweden possesses excellent water power for various kinds of manufacturing, and some of the numerous rivers are used as a source of power. Manufacturing, by use of water power, is making rapid progress here.

Cities of Sweden

The two principal cities — STOCKHOLM, the capital (Fig. 407), and GOTHENBURG — are on the coast; but there are other small seaports and inland mining towns. The situation of Stockholm is one of great beauty. It is on an excellent harbor; and is connected by lake, canal, and rail with the chief points in the country, including Gothenburg. It is the principal distributing center for imports, while Gothenburg is the leading center for exports. The fact that the harbor of Stockholm is blocked with ice for four months each year, while that of Gothenburg is rarely frozen, gives the latter city one advantage as a shipping point.

Foreign trade of Norway and Sweden

The principal foreign trade of both Norway and Sweden is with Great Britain. Give reasons for this. What must be the main articles of import and export? Next to Great Britain comes Germany. Can you suggest reasons for this?

Industries of Denmark

1. Agriculture

Farming, especially dairying, is the chief industry of Denmark. In this small country there are over a million and a half dairy cows and about half as many sheep, besides large numbers of horses, goats, and pigs. Butter forms one half the exports of Denmark. The laws of the nation discourage large farms, so that, as in Belgium, by carefully cultivating a small patch of land, each farmer obtains the most that the soil can yield.

FIG. 407. — A view of Stockholm.

2. Fishing, commerce, and mining

The nearness to good fishing has naturally made fishing important; but the fisheries of Scandinavia are of far greater value than those of Denmark. The Danes have much commerce, and some of the men serve as sailors on the ships of other nations, though to a far less extent than the Swedes and Norwegians.

There is neither coal nor metal in the rocks of Denmark, so that there is no mining in the country. The only mineral product of value is clay. As in Ireland, the lack of coal for fuel is partly met by peat from the bogs and swamps.

3. Manufacturing

The position of Denmark, on one of the leading highways of European commerce, has brought its people into close contact with the rest of the world. The Danes are a very highly educated people, and have much manufacturing. In spite of their lack of raw materials, they make machinery, ships, beautiful porcelain, and many other articles.

Fig. 408. — A scene in Copenhagen.

Foreign trade and leading city of Denmark

As in the case of Norway and Sweden, the principal foreign trade of Denmark is with Great Britain. Therefore one might expect to find an important seaport on the western coast; but that coast is so low, and so shut in by sand bars, that good harbors are lacking. In fact, in all Denmark the only harbor that admits large vessels is Copenhagen (meaning merchants' harbor) on Seeland Island. Since this point guards the entrance to the Baltic Sea, there is a double reason why Copenhagen is the principal city of Denmark. The fact that it is the capital also increases its importance.

Colonies of Denmark and their products

The daring Norwegian sailors of early times, called *Norsemen*, explored many lands, and had colonies even before other countries of northern Europe. When Norway and Denmark separated, these colonies remained a part of the latter country. Although some of these have been lost, Greenland (p. 170) and the Faroe Islands are still Danish colonies, and Iceland is a Danish dependency. In the *Faroes*, a score of small islands north of Scotland, the principal products are sheep and fish. Denmark also owns three islands — St. Croix, St. Thomas, and St. John — in the West Indies. From these, sugar and tropical fruits are obtained.

Iceland, which is larger than Ireland, and more than twice the size of Denmark, is an island of volcanic origin. Over a hundred volcanoes are found there, twenty-five of which have been in eruption in recent times. Mount Hekla is one of the most noted of these. Destructive earthquakes are common, and there are also geysers similar to those found in our Yellowstone National Park. The interior is a desert plateau, in part covered by glaciers, and hence not inhabited. Near the sea, however, there is some good pasture land, and the people are mainly engaged in raising sheep and in fishing. Eider down, from the eider duck, is one of the important products of the island. The people are highly educated. What is the capital of Iceland?

Review Questions

1. What relation have the peoples of these three countries to one another? 2. How have they been connected with us? 3. How has the position of these countries helped to preserve their independence? 4. How have their surface and climate helped toward the same end? 5. Where are the principal agricultural districts? What about their extent? 6. What are the less important industries of Norway? 7. The three leading industries? 8. Name and locate the cities of Norway. 9. Describe the scenery on the western coast. 10. What about agriculture in Sweden? 11. Lumbering? 12. Mining and manufacturing? 13. Name and locate the chief cities of Sweden. 14. What about the foreign trade of Norway and Sweden? 15. What are the agricultural products of Denmark? 16. State the principal facts about the other industries. 17. Tell about the foreign trade and leading city of Denmark. 18. Name and locate the colonies of Denmark. 19. What are their principal products? 20. State the principal facts about Iceland.

Suggestions

1. Why should the telephone prove of special importance among the fishing towns scattered along the coast of Norway? 2. By use of a globe explain why the sun does

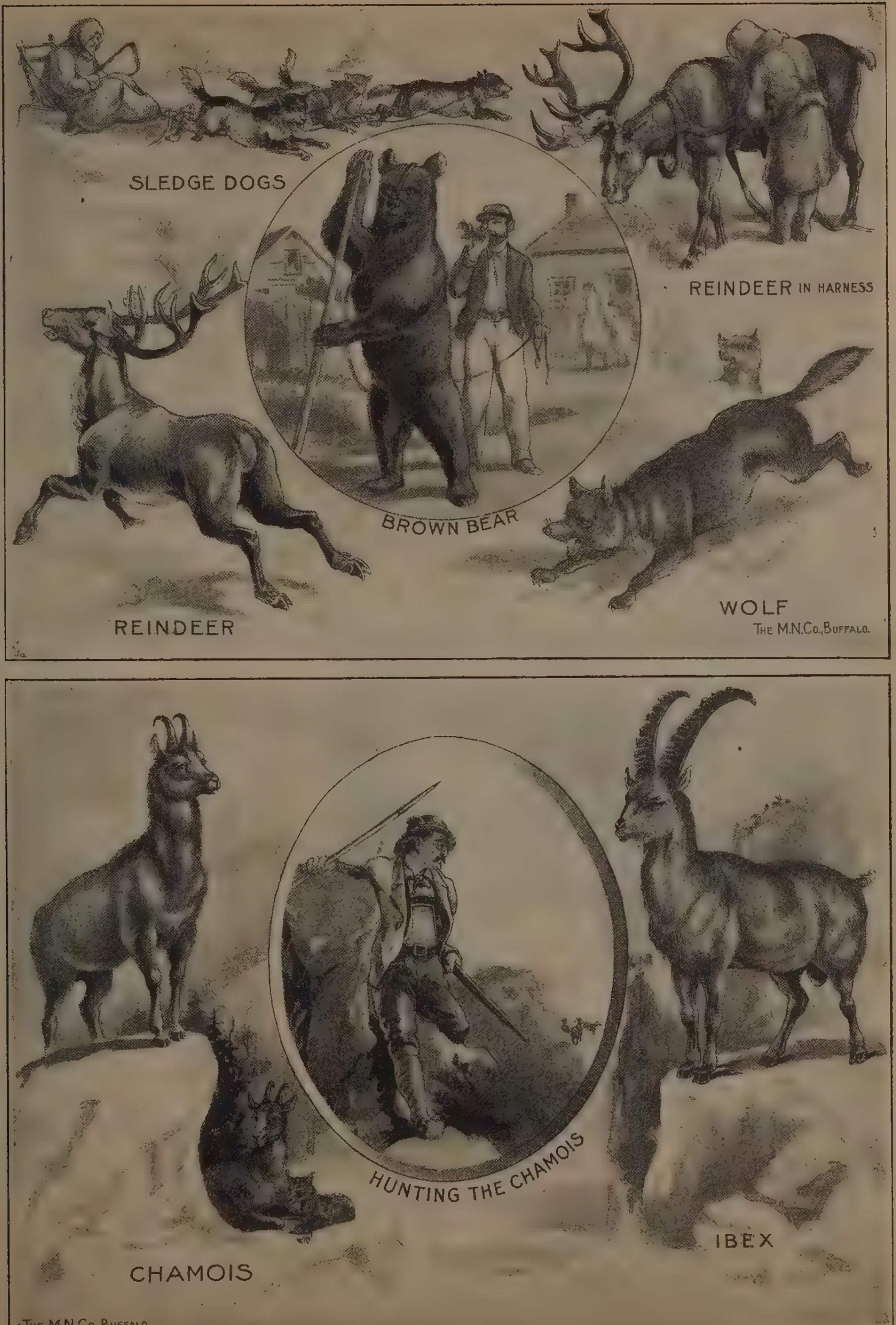


FIG. 409. — Some of the native animals of Europe.

not set for weeks at a time at Hammerfest. 3. Why should Bergen be one of the rainiest cities of Europe? 4. Give reasons why harbors on the Baltic are blocked by ice much oftener than those on the western coast of Norway. 5. Find out about the early Norse explorations of North America. 6. Hans Christian Andersen was a native of Denmark. What fairy stories do you know that were written by him? 7. Read and tell stories of the Norse gods in old-time mythology.

VII. RUSSIA (Fig. 358)

Map Study 1. About how much of Europe is included in Russia (Fig. 358)? 2. What part of the distance from pole to equator is included? 3. What does this suggest concerning climate? 4. How much of the boundary of Russia is seacoast? 5. Name the seas which border it. 6. Name the mountains on or near the border. 7. What portion of Russia is occupied by plains (Fig. 360)? 8. In what directions do the large rivers flow? Name the three longest. 9. Is there any outlet from the Caspian Sea? What does that fact suggest? 10. Find Poland, Finland, and Lapland. 11. What parts of Asia are in the Russian Empire (Fig. 455).

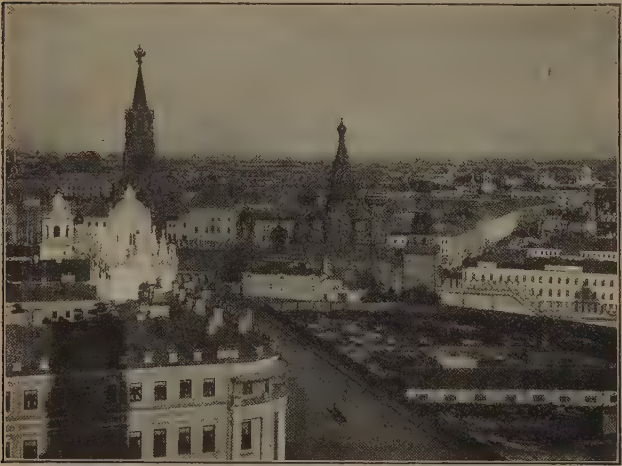


FIG. 410. — The city of Moscow, situated in the midst of the vast, level Russian plain.

Its size and position Russia in Europe is as large as all the other European countries together; and the Russian Empire, which includes Siberia and other lands in Asia (p. 352), occupies about one sixth of all the land upon the globe. What countries in North and South America approach European Russia in area? In variety of climate?

In spite of its vast extent, the development of Russia has been greatly hindered by its position, which causes a lack of good harbors. In this respect it contrasts strongly with the United States. To be sure, the sea forms a large portion of the Russian boundary; but ARCHANGEL, the principal port on the White Sea, is icebound for nine months, and the Baltic ports for four or five months, each year; while the entrances to the Baltic and Black seas are guarded by foreign nations. Why are the Caspian ports of no use for foreign commerce?

Surface features Most of the large rivers of western Europe have their sources in the mountains. Give examples (Fig. 359). It is not so, however, in Russia, where the central divide is a low, hilly region, less than twelve hundred feet above sea level at its highest point. Except for the mountains on and near the border of the country, this is the highest part of Russia.

From what has been said, it is easily seen that most of Russia is a remarkably level plain (Fig. 410). Since several of the rivers are very long, what must be true as to the swiftness of their currents? What, then, must follow as to their value for navigation? What about the ease with which canals can be built?

In southeastern Russia, on the other hand, are the lofty Caucasus Mountains (Fig. 361), one of whose peaks, the extinct volcano Mount Elburz, is the highest mountain in Europe. At the very base of these mountains, however, are broad plains bordering the Caspian Sea. In some places these plains are even below sea level.

Climate
1. Temperature

The great distance of Russia from the Atlantic Ocean, over which the west winds blow, has had an important effect on both the temperature and rainfall. For example, Moscow is in the same latitude as Edinburgh; but while at Edinburgh the average temperature for January is 37°, at Moscow it is nearly 25° colder. What effect must this cold have upon navigation of the rivers? Notice which isotherms pass near Moscow and Edinburgh in July (Fig. 317). From this you see that, though the winters are colder, the summers are much warmer in Russia than in Scotland, in the same latitude.

2. Rainfall

There is far less rainfall in Russia than in Scotland. In the eastern part of the country there is an average of less than twenty inches a year (Fig. 365). Since this amount is barely enough for agriculture, the crops often suffer, and famines follow in especially dry seasons. Southeastern Russia is in the belt of the horse latitudes, and is so far from the ocean that it is too arid for farming without irrigation.

The Caspian Sea, into which the longest river of Europe pours its floods, is the largest inland sea in the world. In spite of the enormous volume of water which enters this sea, the evaporation in that dry climate has caused it to shrink in size until it is no longer connected with the ocean. The same is true of the Aral Sea (Fig. 455). There is so much evaporation in this region that the surface of the Caspian Sea is eighty-five feet below sea level.

3. Climatic belts
(1) ***Tundras***

Russia may be divided into several belts, according to climate. In the north are the frozen *tundras*, even in summer too cold for agriculture. The scattered Laplanders, who live upon the tundras, have habits resembling those of the Eskimos.

(2) ***Forests***

South of the tundra belt the warmer climate permits the growth of *forests*, including such trees as pine, fir, oak, beech, and birch. Some of this timber has been cut away, and farms have taken the place of forests; but much woodland still remains.

(3) ***Grassy plains and arid steppes***

The forest belt is gradually replaced on the south by open, grass-covered plains similar to those of the central and western parts of the United States. This is the best agricultural region of Russia, and here grains are raised in enormous quantities, especially in the "black earth" section where the soil is fine-grained, black, and very fertile. The climate of the grassy plains gradually becomes more arid toward the south and east, until on the *steppes*, which resemble our Western arid lands, farming without irrigation is impossible.

(4) ***The Caucasus region***

In the extreme southern part of Russia, near the Caucasus Mountains, there is abundant rainfall; and, being so far south, the crops of warm temperate climates are raised, but around the Caspian Sea most of the land is a barren desert.

People
1. Races and languages

The plains of Russia have offered no barrier to invasion. Therefore, many different peoples have come to this region from various directions, and they are now united under Russian rule. Most of these belong to the white race, though to a different division from the German and British peoples. These Russians are *Slavs*, while the inhabitants of Germany, Scandinavia, and the British Isles belong to the *Teutonic* division of the white race. Russia also contains many Jews, Teutons, and other people, including Lapps (Fig. 404) and Finns, both of whom are classed with the Mongolian race. All together, not fewer than forty languages are spoken within the realm.

2. Civilization

In former centuries, while other parts of Europe were advancing in civilization, Russia was still being raided by hordes of outsiders. The country was so far away from western Europe that it felt little influence from the growing civilization of the West. Moreover, approach by water was then even more difficult than now, for at that time the only seacoast that Russia owned was on the Arctic Ocean. It was not until the time of Peter the Great (1682–1725) that Russia began to learn the lessons of civilization from other European nations.

These facts help to explain why Russia is so slightly advanced in some directions. While the common people of other European nations were demanding greater liberty, and were steadily gaining education, the masses of the Russians were kept in poverty and ignorance. They were mere *serfs*, who were little better than slaves to their lords, the nobles. The serfs were freed in the middle of the last century; but, even now, little attempt is being made to educate the masses, and they have little liberty.

Fig. 411. — A family of Russian peasants.

Government

The emperor, or Czar, is an absolute monarch, "whose will alone is law." In purely local matters, however, the peasants have a voice. Those of each locality meet in a *Mir*, or assembly, to discuss matters of common interest and to elect officers from their number, somewhat as is done in town meetings in the United States.

Many of the Russians have long been dissatisfied with this form of government, and have demanded that the people be given more power. At last the Czar has allowed the people to elect a national body of representatives, called the *Duma*. They are, however, able to do little beyond what the rulers allow, and there is still much complaint.

Lumbering and fishing

Nearly a third of European Russia is forest-covered; and, as in Norway (p. 297), timber is one of the leading resources. Many fur-bearing animals live in the forest, and Russia, like Canada, exports large numbers of valuable furs.

Fishing is an important industry in Russian waters, and the varieties of fish resemble those of Norway and Sweden. There is a special demand for fish, owing to the number of fast days kept by the Græco-Russian Church, to which the majority of Russians belong.

Agriculture

1. Farming

Both in the forest region and on the open plains to the south, there is extensive agriculture. Fully nine tenths of the people are supported by farming, which shows that Russia is mainly an agricultural country.

The most important crops are the grains, especially rye, wheat, barley, and oats. Russia ranks next to the United States among the grain-producing countries of the world, and wheat is one of its principal exports. Another important crop is hay; and potatoes, sugar beets, and flax are extensively raised in the cool temperate climate. In southern Russia the warm climate permits the culture of grapes, tobacco, and corn; and south of the Caucasus even olives and cotton are grown.

2. Grazing

On the grazing lands of the arid steppes many sheep, cattle, and horses are raised. The nomadic herdsmen still retain many of the customs of the shepherds and herders of Bible times, who dwelt farther south in Asia. This is the home of the *Cossacks*, a people of Tartar

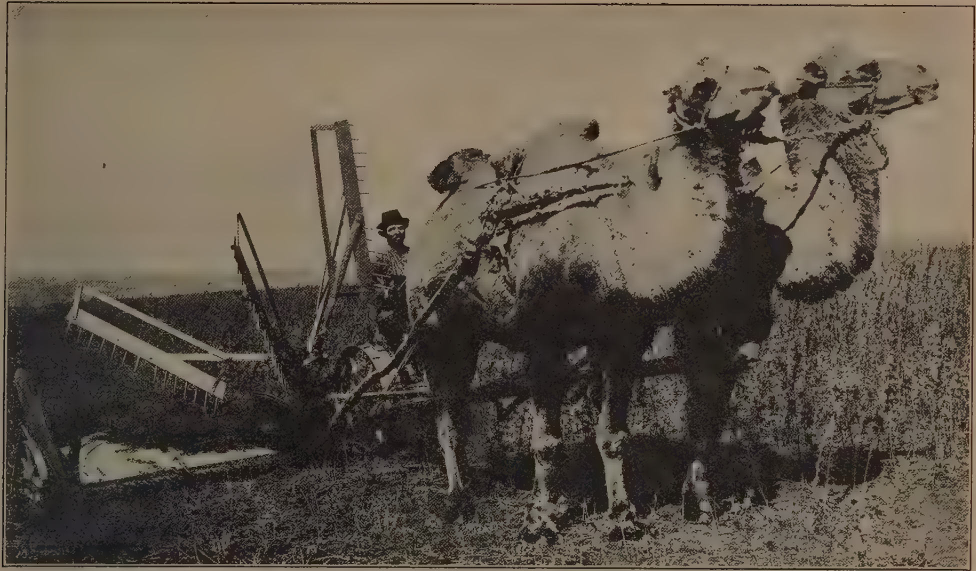


Fig. 412. — Harvesting wheat with camels in southeastern Russia.

descent noted for their skill as horsemen and for their fierce bravery.

Mining

Some parts of Russia contain mineral deposits of great value. In the Ural Mountains, for example, are gold, silver, copper, and platinum, besides some precious stones and graphite, or "black lead," used in lead pencils. Coal and iron are mined in several parts of Russia (Fig. 362), and each year the amount is increasing. As in Great Britain, some of the iron ore is so near coal and limestone that it is easily smelted.

Russia ranks next to the United States in the production of petroleum. This oil is found in several places, especially about Baku on the Caspian Sea. Large quantities are consumed as fuel for steamers on the Caspian and Volga; and, as in California, the oil is used in locomotives.

Manufacturing

Numerous factories have recently been started in Russia, but most of the manufacturing is still done by hand, in the homes of the workmen.

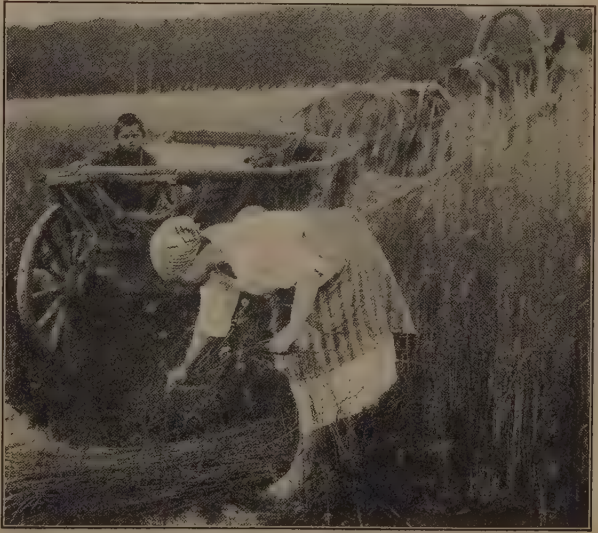


Fig. 413. — A Russian peasant girl harvesting wheat by hand.

What a contrast to the United States and to Great Britain! Distilling and brewing, cotton manufacturing and sugar refining, are the principal forms of manufacturing carried on in factories; flour mills, woolen and linen factories, and iron works rank next in importance. What raw products of Russia encourage these industries?

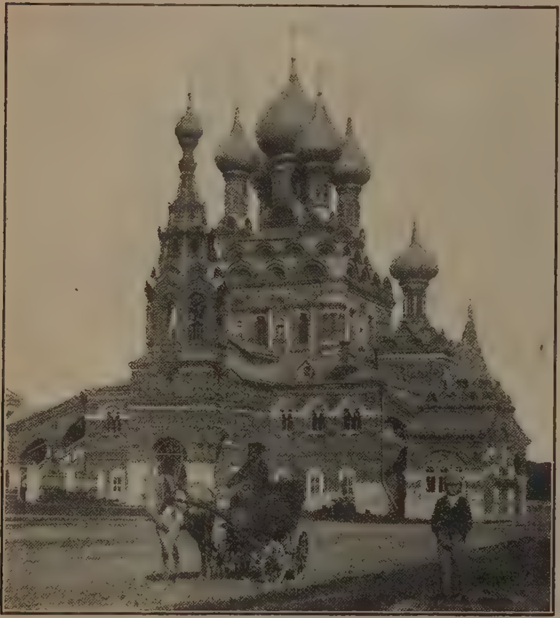


FIG. 414. — A Græco-Russian church in Moscow.

Principal cities

1. Moscow and Nizhni Novgorod

For a long time the principal cities of Russia were situated far in the interior. This clearly shows how little Russia was in touch with other countries. For example, MOSCOW, the second city in size, and once the capital of the empire, is located almost in the center of the realm, as Madrid is in Spain. The point was well chosen, because rivers, which could easily be connected by canals, diverge from this section in all directions. By the introduction of railways the advantage of this central location was so increased that Moscow is now the leading railway center of Russia as Madrid is of Spain, and for the same reason. State this reason (p. 293). Unlike Madrid, the land round about the city is fertile and densely populated. All these advantages have made Moscow one of the chief manufacturing centers of the empire.

Moscow is adorned with royal palaces, government buildings, and churches (Fig. 414). It is the holy city of Russia, being the center of the Græco-Russian Church. The University of Moscow, the largest in the empire, is attended by about four thousand students.

East of Moscow, on the Volga River, is NIZHNI NOVGOROD, renowned for its yearly fairs. For centuries a great trade center has been needed, somewhere in this vicinity, for the exchange of Asiatic and Russian products. This city has such excellent water connections that it has served as that center. On the map (Fig. 358) point out these connections. The fairs, held in August and September, are the greatest in Europe, and attract as many as two hundred thousand strangers each year. In a single season goods are exchanged to the value of nearly $200,000,000, and prices are fixed on crops and other materials for the coming year.

2. Petrograd and Riga

While the two cities just described are very old, their position in the interior is not favorable for commerce with distant nations. It was this fact that led Peter the Great, in 1703, to found PETROGRAD at the head of the Gulf of Finland. The site chosen is very marshy, and the climate is cold, foggy, and unhealthful. Moreover, the arm of the sea on which the city is located is so shallow that a ship canal twenty miles in length has been necessary in order to connect it with the deeper water farther west. In addition, the harbor is ice-bound for more than four months each year.

Yet, in spite of all these disadvantages, Petrograd is the largest city in Russia, and the fifth in size in Europe. This growth is partly due to the need of a seaport in this section, and partly to the fact that the city is the capital of a great empire. More goods are shipped from this point than from any other Baltic port. RIGA, to the southwest, has about half as much shipping.

Petrograd is a well-planned city, having especially wide streets, splendid public buildings, and fine residences.

FIG. 415. — A Russian sleigh in Petrograd.

3. Odessa

ODESSA, another important seaport, was founded a little over a century ago, when Russia gained possession of the northwestern coast of the Black Sea. Besides being the chief outlet for the vast grain trade of southern Russia, and the principal port on the Black Sea, Odessa is an important flour-milling center, like Minneapolis.

4. Warsaw and Lodz, in Poland

Thus far the Russians have not found it possible to obtain possession of Constantinople, although they have, no doubt, felt many a yearning in that direction. Why? They have, however, extended their territory in other directions. For example, they have gained much land in central Europe. At one time there was a powerful kingdom here, called *Poland*, but this was divided among Russia, Austria, and Germany. Russia obtained the largest share, and in this portion are situated WARSAW and LODZ, two of the leading cities in the empire. The former is a center for the railways that connect Russia with western Europe, and the latter is an important manufacturing city. Much coal and iron are mined in this vicinity.

Finland

Finland, whose capital is HELSINGFORS, although a part of the Russian Empire, has a measure of independence. It has a parliament which makes its laws, but the Czar has the right of veto upon them. Unlike the Russians, most of whom belong to the Græco-Russian Church, the Finns are mainly Protestants, belonging to the Lutheran Church. They are a nation of highly educated people. But it has been the policy of the Russian government to destroy their existence as a nation. On account of mistreatment from the Russians, many Finns and Poles have migrated to the United States.

Review Questions

1. Show how large Russia is. 2. What about its harbors? 3. Describe its surface. 4. What can you say about the temperature? 5. The rainfall? 6. Into what climatic belts can the country be divided? 7. What different races are found among the Russians, and how many languages are spoken by them? 8. Why have they not advanced further? 9. What is the condition of the government? 10. Tell about lumbering and fishing. 11. What are the agricultural products? 12. The mineral products? 13. What is the condition of manufacturing? 14. Locate and state the principal facts about Moscow and Nizhni Novgorod. 15. Petrograd and Riga. 16. Odessa. 17. Warsaw and Lodz. 18. Finland.

Suggestions

1. Compare the area of the Caspian Sea with that of Lake Superior. 2. Read about how the inhabitants of Moscow burned their houses in 1812 rather than give shelter to Napoleon's army. What followed? 3. What must be some of the difficulties connected with building good wagon roads in southern Russia? 4. What did Kosciusko, the Pole, do to make his name memorable to Americans? 5. Have you read the story of Thaddeus of Warsaw? If so, what can you tell

about it? 6. Read how Peter the Great wandered through European countries, as a common workman, in order to learn Western customs. 7. Make a sketch map of Russia, with principal rivers and cities. 8. Compare Russia with the United States in area and population (Appendix, pp. 424 and 426); also in degrees of latitude contained.

VIII. German Empire

Map Study

1. Compare the latitude of Berlin with that of London (Fig. 358). 2. Of New York. 3. Estimate the greatest length of Germany from east to west (Fig. 416); from north to south. 4. How does it compare in size with the British Isles? With Russia? 5. What parts of the boundary are natural? 6. Point out the principal rivers. In what direction do they flow? 7. Is most of the surface plain or mountainous (Fig. 359)? Where are the mountains? 8. What facts do you notice about the coast line? 9. Is the North Sea, or the Baltic, the more desirable place for seaports? Why?

Position, and its advantages

The position of the German Empire is strikingly different from that of Great Britain. Only about one third of its boundary is water, while it borders upon seven independent countries, besides Luxemburg (p. 283). What are their names?

The location of the British Isles is favorable for world commerce, because densely populated Europe lies near at hand on one side, while the New World lies across the ocean on the other side. Germany also has great advantages in her location. Because it is so central, most of the markets of the continent are at her very doors, while two of her principal ports, Hamburg and Bremen, face Great Britain and the west. Name some of the large European cities (Fig. 358) that can be quickly reached from Germany. In these days of railways, Germany's central position is superior to that of England for European trade.

Formation of the empire; present area and population

It has required a long struggle to bring under one rule the various people living within the boundary of the German Empire. For centuries there were many separate states in central Europe with a German-speaking population; and, although they were loosely held together by a confederation, they were often at war with one another. Their condition was, in some respects, similar to our own just after the Revolutionary War. During the War of 1866, Prussia and Austria, the principal kingdoms of the *German Confederation*, fought for leadership. Prussia proved successful, and Austria withdrew from the union. In 1871, under the lead of Prussia, the *German Empire*, with its present boundaries, was established.

It contains nearly two hundred and nine thousand square miles, being a little larger than France, and twice the size of Colorado. But it has nearly sixty-five million inhabitants, or about eighty-one times as many as Colorado, and twenty-five million more than France.

Government

All together there are twenty-six states within this empire, some of them being *kingdoms*, some *duchies*, and some merely *free towns*. The smallest is the Free Town of Bremen, which includes only ninety-nine square miles, and two hundred and ninety-eight thousand inhabitants. The largest is Prussia, whose area is more than half that of the entire empire, and whose population is about five eighths that of all Germany.

These states are united under a central authority, more closely than our states. In place of a President they have an Emperor, the *King* of Prussia being by law the *Emperor* of Germany; and their form of government is a limited monarchy. The power of the German Emperor is, however, much greater than that of the British King, though far less absolute than that of the Russian Czar.

Why the boundary is so irregular

In a war with France, in 1870, the Germans defeated the French, and seized some French territory west of the Rhine, called Alsace-Lorraine, in which Metz and Strassburg are situated. Much of Germany's irregular frontier has been determined in a similar

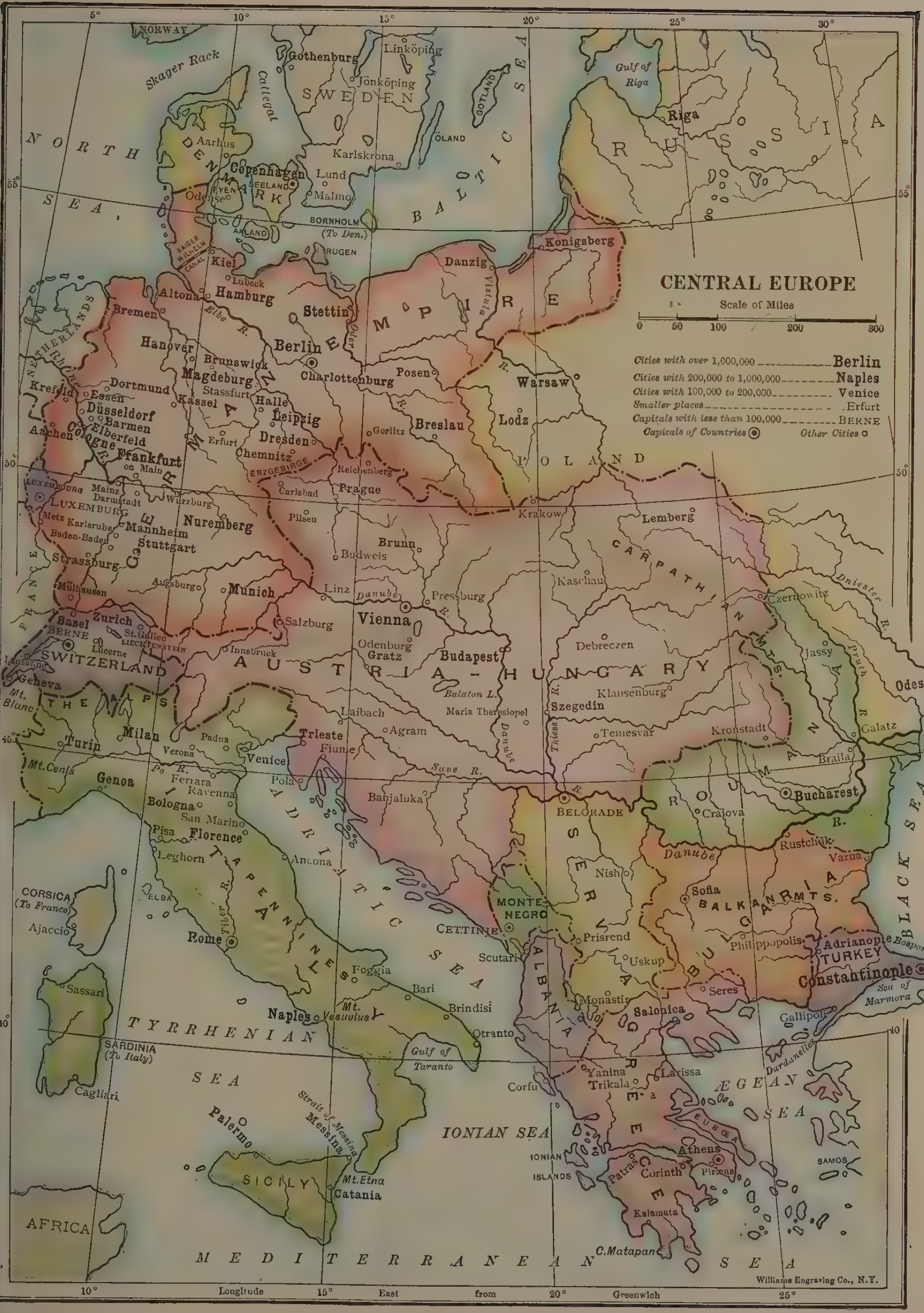

CENTRAL EUROPE
Scale of Miles
0 50 100 200 300
Cities with over 1,000,000 Berlin
Cities with 200,000 to 1,000,000 Naples
Cities with 100,000 to 200,000 Venice
Smaller places Erfurt
Capitals with less than 100,000 BERNE
Capitals of Countries ⊙
Other Cities ○
5° 10° 15° 20° 25° 30°
55° 50° 45° 40°
Longitude 15° East from 20° Greenwich 25°
NORWAY
Skager Rack
Cattegat
Gothenburg
Linköping
Jönköping
SWEDEN
GOTLAND
ÖLAND
Karlskrona
Lund
Malmo
BALTIC SEA
NORTH SEA
Aarhus
DENMARK
Copenhagen
SEELAND
FYEN
Odense
BORNHOLM (To Den.)
AALAND
RUGEN
KAISER WILHELM CANAL
Kiel
Lubeck
Gulf of Riga
Riga
RUSSIA
Konigsberg
Danzig
Vistula
Altona
Hamburg
Bremen
Stettin
Oder
GERMAN EMPIRE
Elbe R.
NETHERLANDS
Rhine
Hanover
Brunswick
Berlin
Charlottenburg
Posen
Warsaw
Lodz
Magdeburg
Stassfurt
Halle
Leipzig
Krefeld
Dortmund
Essen
Düsseldorf
Barmen
Elberfeld
Aachen
Cologne
Kassel
Erfurt
Dresden
Chemnitz
ERZGEBIRGE
Gorlitz
Breslau
Frankfurt on Main
Reichenberg
POLAND
LUXEMBOURG
Mainz
Darmstadt
LUXEMBURG
Würzburg
Carlsbad
Prague
Krakow
Lemberg
Metz
Karlsruhe
Mannheim
Nuremberg
Pilsen
Baden-Baden
Stuttgart
Brunn
Budweis
CARPATHIAN MTS.
Kaschau
Dniester R.
Strassburg
FRANCE
Augsburg
Munich
Linz
Danube
Pressburg
Czernowitz
Mülhausen
Zurich
Salzburg
Vienna
Basel
BERNE
St. Gallen
LIECHTENSTEIN
Odenburg
Debreczen
Jassy
Pruth R.
Lausanne
Lucerne
Innsbruck
Gratz
Budapest
AUSTRIA-HUNGARY
SWITZERLAND
Geneva
Klausenburg
Odessa
Mt. Blanc
THE ALPS
Balaton L.
Maria Theresiopel
Szegedin
Laibach
Agram
Thiess R.
Temesvar
Kronstadt
Galatz
Turin
Milan
Padua
Trieste
Fiume
Verona
Venice
Braila
Mt. Cenis
Po R.
Genoa
Ferrara
Ravenna
Pola
Save R.
Banjaluka
Belgrade
ROUMANIA
Bucharest
Craiova
Bologna
San Marino
Pisa
Florence
Leghorn
ADRIATIC SEA
SERVIA
Rustchuk
Varna
Danube
BLACK SEA
Ancona
Nish
Sofia
BALKAN MTS.
BULGARIA
CORSICA (To France)
ELBA
MONTENEGRO
CETTINJE
Prisrend
Ajaccio
Rome
Tiber R.
APENNINES
Scutari
Uskup
Philippopolis
Adrianople
Bosporus
TURKEY
Constantinople
Sea of Marmora
Foggia
ALBANIA
Seres
Sassari
Bari
Monastir
Salonica
Naples
Mt. Vesuvius
Brindisi
Gallipoli
TYRRHENIAN SEA
Otranto
Gulf of Taranto
SARDINIA (To Italy)
Dardanelles
Corfu
Yanina
Trikala
Larissa
ÆGEAN SEA
Cagliari
Strait of Messina
Messina
Palermo
IONIAN SEA
GREECE
EUBŒA
IONIAN ISLANDS
Athens
Piræus
SAMOS
Patras
Corinth
SICILY
Mt. Etna
Catania
Kalamata
AFRICA
C. Matapan
MEDITERRANEAN SEA
Williams Engraving Co., N.Y.

FIG. 416.

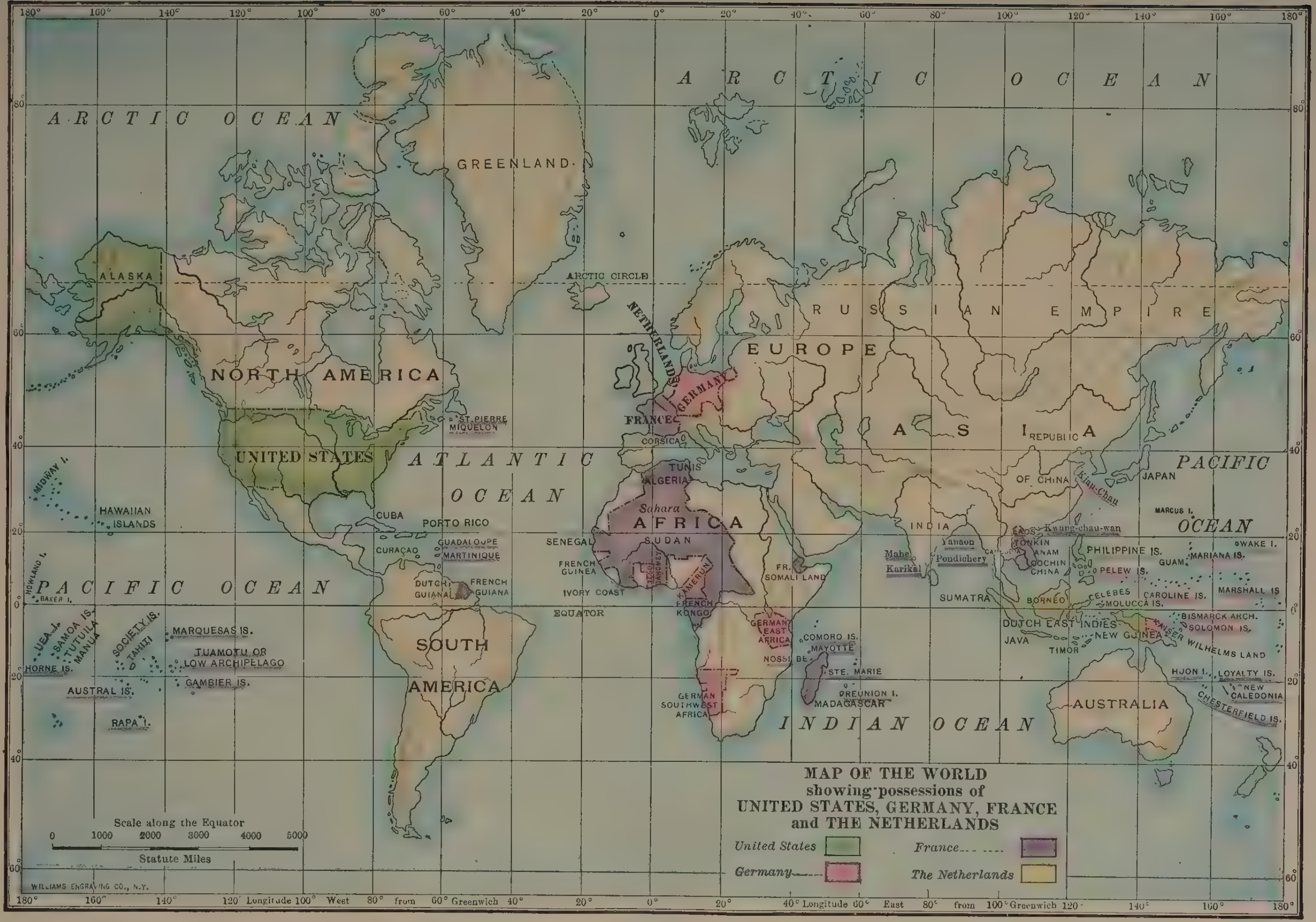

MAP OF THE WORLD
showing possessions of
UNITED STATES, GERMANY, FRANCE
and THE NETHERLANDS
United States 🟩
France 🟪
Germany 🟥
The Netherlands 🟨
Scale along the Equator
0 1000 2000 3000 4000 5000
Statute Miles
WILLIAMS ENGRAVING CO., N.Y.
120° Longitude 100° West 80° from 60° Greenwich 40°
40° Longitude 60° East 80° from 100° Greenwich 120°
ARCTIC OCEAN
ARCTIC OCEAN
GREENLAND
ARCTIC CIRCLE
ALASKA
NORTH AMERICA
UNITED STATES
ST. PIERRE
MIQUELON
ATLANTIC OCEAN
CUBA
PORTO RICO
GUADALOUPE
MARTINIQUE
CURAÇAO
DUTCH GUIANA
FRENCH GUIANA
SOUTH AMERICA
EQUATOR
PACIFIC OCEAN
MIDWAY I.
HAWAIIAN ISLANDS
HOWLAND I.
BAKER I.
UEA I.
SAMOA IS.
TUTUILA
MANUA
HORNE IS.
SOCIETY IS.
TAHITI
MARQUESAS IS.
TUAMOTU OR LOW ARCHIPELAGO
GAMBIER IS.
AUSTRAL IS.
RAPA I.
NETHERLANDS
GERMANY
FRANCE
CORSICA
EUROPE
RUSSIAN EMPIRE
TUNIS
ALGERIA
Sahara
AFRICA
SUDAN
SENEGAL
FRENCH GUINEA
IVORY COAST
DAHOMEY
KAMERUN
FRENCH KONGO
FR. SOMALI LAND
GERMAN EAST AFRICA
COMORO IS.
MAYOTTE
NOSSI BE
STE. MARIE
REUNION I.
MADAGASCAR
GERMAN SOUTHWEST AFRICA
INDIAN OCEAN
ASIA
REPUBLIC OF CHINA
Kiau-Chau
JAPAN
INDIA
Mahe
Karikal
Yanaon
Pondichery
LAOS
Kwang-chau-wan
TONKIN
ANAM
COCHIN CHINA
PHILIPPINE IS.
PELEW IS.
GUAM
MARIANA IS.
WAKE I.
MARCUS I.
PACIFIC OCEAN
MARSHALL IS.
CAROLINE IS.
CELEBES
MOLUCCA IS.
SUMATRA
BORNEO
DUTCH EAST INDIES
JAVA
TIMOR
NEW GUINEA
KAISER WILHELMS LAND
BISMARCK ARCH.
SOLOMON IS.
HJON I.
LOYALTY IS.
NEW CALEDONIA
CHESTERFIELD IS.
AUSTRALIA

FIG. 417.

way. Mountains form the southern boundary, to a great extent, and water the northern; but the eastern and western limits, largely decided by war, do not follow any natural barrier. Draw an outline map of Germany, to show this boundary line.

Preparation for defense of the country

In order to hold her present boundaries, Germany must be prepared to defend them at any time. This need calls many citizens to an occupation which we have not thus far considered; namely, that of *preparing for war.*

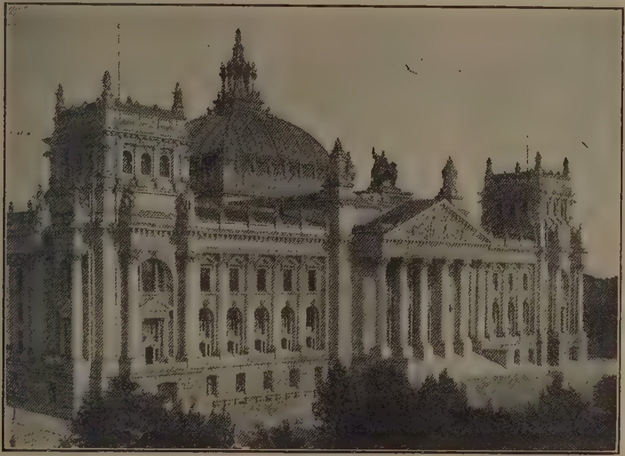


FIG. 418. — The building in Berlin where the German Parliament meets.

Each of the great European nations is jealously watching the others; and since no one of them knows how soon a dispute may arise with its neighbor, each keeps a large and thoroughly prepared army. Until permanent peace is established it will probably be necessary for each nation whether at war or in peace to maintain a large standing army.

For such reasons, all able-bodied young men in Germany are required to devote usually two full years, and parts of several following years, to active military training. Most of them enter the service at about the age of twenty; and as some five hundred thousand men fit for military service reach that age every year, one can gain an idea as to what such preparation costs.

During times of peace, the German army contains nearly six hundred thousand soldiers; and the German navy calls for many men besides. All these men are, for the time being, withdrawn from the industries, so that the nation loses the fruits of their labor for that period. Is this an advantage to a nation?

Strong forts are built near the boundary, as at Cologne, Metz, and Strassburg on the French side, and Königsberg and Posen near Russia. Forts are also numerous in the neighborhood of the great interior cities, and at other important points. The cost of these strongholds, with the vast sums of money required to keep up the army and navy, makes a heavy drain upon the nation.

Germany is not unlike other leading European nations in these respects. As already stated (p. 275), the British, having no close neighbors, rely mainly upon their powerful navy for defense. Every one of the Great Powers demands the service of many men, and expends large sums of money either for the army, or navy, or both. In fact, preparation for war is one of the great occupations of Europe to-day.

Surface features

1. The highlands

Germany includes two quite different kinds of land. The southern section is mainly a region of ancient mountains, worn down to low relief like the mountains of Great Britain and New England. It is, in fact, a somewhat irregular plateau, from one to two thousand feet in height, with some ranges rising high enough to be called mountains (Fig. 419). Only in the extreme south, on the edge of the Alps, is a great altitude reached. Here one peak rises nearly ten thousand feet above sea level.

2. The lowlands

Northern Germany, on the other hand, is a lowland whose elevation is rarely more than six hundred feet. This lowland, mainly in Prussia, broadens toward the east until it merges into the plains of Russia. In the neighborhood of Holland this plain is very low and flat (Fig. 420); but in most places its surface is rolling, owing partly to the irregular deposits left by the Great Glacier.

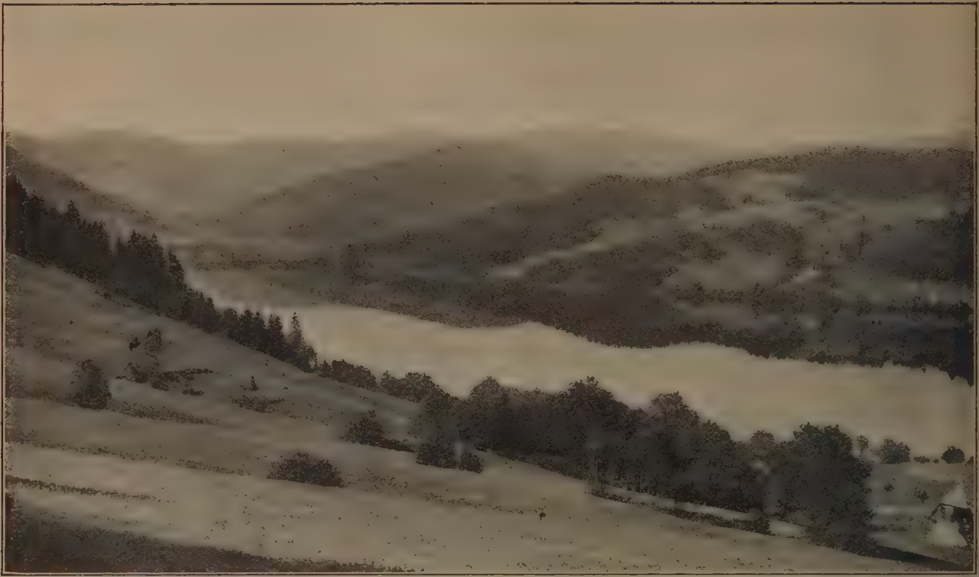


Fig. 419.— A view in the Black Forest, one of the low mountain regions of southern Germany.

3. Drainage Most of the drainage of Germany is northward into the North and Baltic seas. Name and trace the courses of four large rivers which flow northward. What river has some of its head-waters in the highland region of southern Germany, then crosses Austria and finally enters the Black Sea?

Note the number of degrees of latitude included in Germany.

Climate

1. Temperature One might expect a warmer climate in the south than in the north; but on account of its elevation, the southern plateau is about as cold in winter as the northern lowland. In summer, on the other hand, the southern part, being nearer the interior of the continent, is warmer than the northern. There are some low, partly inclosed valleys in the south, however, where the climate in winter as well as in summer is warmer than that of the northern plains.

The influence of the warm waters of the ocean is very well shown along the coast. For example, the ports of the North Sea, being most open to the ocean, are almost always free from ice; but the Baltic ports, being cut off so completely from the open ocean, are frozen over during a part of the winter. The farther east they lie, the longer their trade is interrupted by the ice. What must be some of the results of this fact?

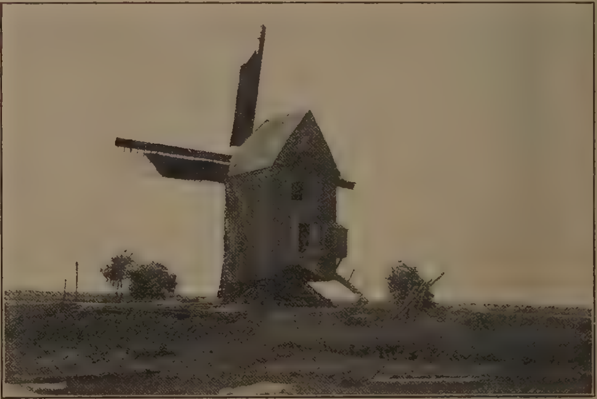


Fig. 420.— A view on the low level plain of north Germany.

2. Rainfall

There is ample rainfall for agriculture in all parts of the empire. It is true that there is less rain than in eastern United States; but in the cooler summer climate of Germany not so much is needed by plants, because there is less evaporation. In the United States, east of the Mississippi, there is an average annual rainfall of about forty inches; but in Germany there are only twenty-eight inches in the west, and twenty inches in the east, near the Russian border.

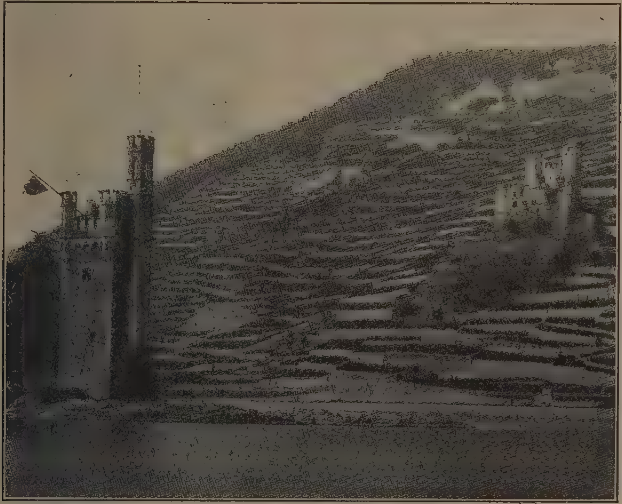


FIG. 421.—Vineyards on the steep slope of the Rhine Valley near Bingen. The land is terraced here and the small patches of vineyard are inclosed within walls of rock.

Lumbering

1. Location and extent of the forests

There are several low mountain areas in Germany where the soil is too poor for farming, but where the slopes are not too steep, or cold, for forest growth. Indeed, the German word for woods (*wald*) is a part of some of the mountain names, as in Schwartzwald, which means Black Forest (Fig. 419). Forests also cover some of the lowlands where the soil is poor. All together about one fourth of the surface of the empire is covered with trees.

2. Care of the forests

The good sense of the German people is well shown by the way they treat their woodlands. Instead of wastefully destroying them by fire and the ax,—as has been done in so many parts of our country,—the Germans have developed an excellent system of forest culture. Trees are planted in place of those that are cut for timber, and they are given proper care, so that the woods continue to be abundant. In this way the forest is made to yield a profit every year, just as a farm does. Germany produces a large part of the lumber she uses, and also exports a great deal.

It is partly the example of the Germans that has led our own country, at last, to begin to pay attention to the care of our forests. Our government has set aside many large forest reservations (p. 126), and schools of forestry have been started at the universities, where young men are trained for the profession of Forestry.

Agriculture

1. Its importance

On the whole, Germany has not a fertile soil; but the farm products are very extensive, because the people are both industrious and intelligent, and their method of cultivating the soil is excellent. What countries may well be contrasted with Germany in this respect? More than one third of the German people depend for their living upon agriculture, the leading industry of the nation.

2. Farm crops

Germany is one of the most important grain-producing countries of Europe; but here rye takes the place of wheat as the principal grain. Potatoes, introduced from America, are raised in such quantities that, like rye, they form one of the principal foods. These two crops are extensively cultivated, both because they are cheap foods, and because they flourish in a light soil and a cool summer climate. Sugar beets, hay, oats, and barley are other important crops of the northern plains, while in the valley of the Rhine, and in other warm, sheltered valleys of the south, hops, tobacco, and grapes are raised in large quantities (Fig. 421).

3. Live stock

Since much of the lowland is too sandy for cultivation, and much of the highland too rugged, it is not surprising that one sixth of all the surface is natural pasture. Cattle for beef and for dairy purposes are kept in nearly all parts of the empire, but especially in the damper climate of the west. Largely because wool can be imported so cheaply, the raising of sheep in Germany is becoming of less importance. Swine raising, on the other hand, is increasing because of the cheap feed supplied by the refuse from the beet-sugar factories.

Although Germany raises a great quantity of food, her population, like that of England, is so dense that she cannot produce all that she needs. Much wheat and meat must therefore be imported.

Mining

Next to the United Kingdom, Germany is the greatest mining country of Europe; and, as in Great Britain, her most valuable minerals, coal and iron, often occur in the same region. Germany reminds us of our own country in the wide distribution of her coal beds. The coal fields that were found in northeastern France and Belgium (Fig. 362) extend into Germany in the neighborhood of AACHEN; and from this point eastward to the Russian border there are several important coal fields.

Among the other valuable mineral products are lead, copper, silver, zinc, and salt. Nearly half the silver mined in Europe comes from Germany; and Belgium and Germany together produce more zinc than all the rest of the world. There are immense salt mines, as at STASSFURT, from which are obtained not only table salt, but products used in the manufacture of soap, in dyeing, bleaching, glass making, and calico printing.

The Germans make use of thoroughly scientific methods in their mining work; and from them other nations have learned many of the methods used in reducing ores to metal.

Manufacturing
1. Its importance

From the above facts we may expect to find Germany an important manufacturing country, with her manufacturing centers well distributed. Explain why. About a third of the people are engaged in manufacturing, and in recent years Germany has advanced very rapidly in this industry. Among the European countries she now ranks next to the United Kingdom in the quantity and excellence of her goods.

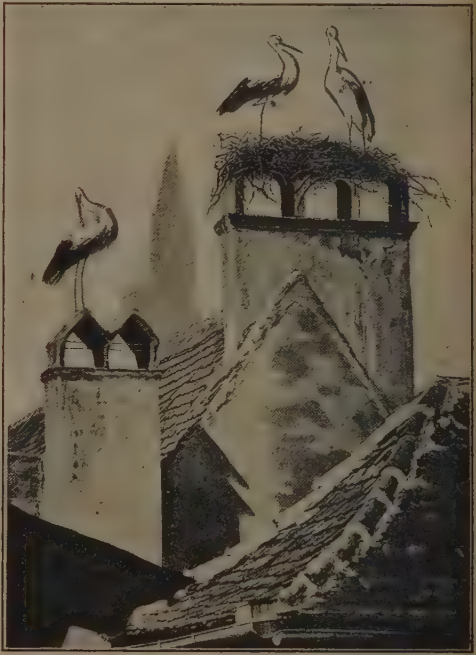


FIG. 422. — Storks in Strassburg, where they build their nests on the chimney tops.

2. Leading centers of manufacturing

The position of the coal and iron mines accounts for the location of the principal centers for iron manufacturing. The busiest section is along the Rhine, in the vicinity of COLOGNE; and this region may well be compared with northern England in the extent of its industries. A second center is round about DRESDEN and CHEMNITZ; and a third is at BRESLAU in the southeastern corner of the empire.

The map (Fig. 416) shows no cities south of BRESLAU; yet this is a busy manufacturing region. Cities are lacking here because the people carry on the manufacturing mainly in their own homes, instead of in factories. Therefore, although villages stretch for miles along the valleys, there are no large towns.

3. Leading kinds of manufacturing

(1) *Textile and iron goods*

As in several other countries so far studied, the textile industries are best developed near the coal fields. Therefore the sections mentioned above are noted for cotton, woolen, and silk factories, as well as for iron. All the cotton and silk, and much of the wool, for these textile industries has to come from abroad. But the people south of Breslau make use largely of raw materials raised near by, spinning and weaving flax and wool and making lace.

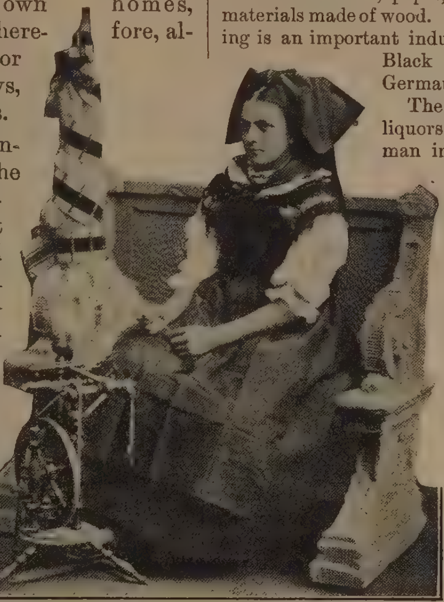


Fig. 423. — A German peasant girl spinning wool.

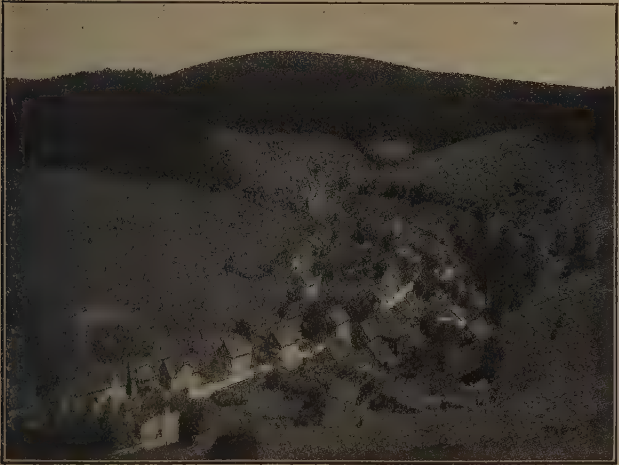


Fig. 424. — A village in the Hartz Mountains, where the people carve articles of wood in their homes.

(2) *Lumber and lumber products*

The extensive forests partly account for a third occupation in many sections; namely, the manufacture of furniture, paper, and other materials made of wood. Wood carving is an important industry in the Black Forest and other parts of Germany.

(3) *Beverages*

The manufacture of spirituous liquors is another prominent German industry. A portion of the immense potato crop, and also some of the beets, are made into spirits. But beer, in the manufacture of which barley and hops are used, is made in much greater quantities. From the grapes of southern Germany much wine is produced, though not nearly so much as in France.

(4) *Beet sugar*

Germany is also a great sugar-manufacturing nation. Until a few years ago nearly all sugar was obtained from sugar cane; but this was changed when German chemists found a means of obtaining sugar from beets. By improving the process, and by developing the beets until they contained more sugar, the industries of sugar-beet raising, and the refining of beet-root sugar, have been made possible. This industry has now spread to many countries, including the United States.

Each year this kind of sugar has been proving a greater rival to sugar cane, until now a large part of the sugar used in Europe, and much of that consumed in North America, is obtained from sugar beets. One important reason why this industry has thrived is that sugar beets grow in a cool temperate climate, where population is dense and markets are numerous. How is the case different with sugar cane? Formerly Germany had to rely upon foreigners for sugar; but with the growth of this industry, beet sugar has not only supplied all the needs at home, but has even become one of the leading German exports.

Germany's rapid advance

1. Nature of the advance

In the last half century no other European country has grown as rapidly as Germany. There has been a large increase in population, a great advance in industry, and a corresponding gain in wealth.

2. Reasons for it

(1) *The government*

One cause for this advance is the strong central government established in 1871. This caused the people to forget the petty jealousies that had long checked the growth of industries, and led them to unite to develop the resources of the empire.

(2) *Education*

The government's treatment of education has also been of great importance. Every German child is forced by law to attend school; and careful attention is given to the study of the industries, foreign products, foreign languages, etc. In the higher commercial and technical schools young men are given excellent training for business, while in many other countries there is little or no opportunity for such education.

The value of scientific work is fully recognized and encouraged by the government; and the wonderful development of the sugar industry, the mines, and the factories since 1871 proves that this has been a wise policy. Not many years ago much of the manufacturing was done by hand; but now factories are found on every side, and Germany is one of the three leading manufacturing nations of the world. Name the other two.

(3) *Improvement in transportation*

Great advance has been made in transportation. The rivers and harbors have been made more useful; canals have been extended over much of the country; and German steamship lines have been established to various parts of the world. There is now an excellent system of railways, reaching to all parts of the empire, and connecting Germany with other European countries. The piercing of the Alps by tunnels, thus improving the connection with the Mediterranean, has also been of advantage.

(4) *Establishment of colonies; and interest of German emigrants*

The establishment of colonies has been a fourth important aid to Germany's growth. The empire now controls extensive areas in the island of New Guinea, north of Australia, and in both East and West Africa, as well as smaller colonies elsewhere (Fig. 417). These have had influence on Germany, both because they have furnished homes for emigrants from crowded parts of the home country, and because they have brought much trade to Germany.

Many more Germans have emigrated to various parts of the New World. Over five million have come to the United States within the last seventy-five years, while the British Isles have sent us about seven million. Many of the German emigrants to these other countries have kept up trade with their *fatherland*, and have thereby increased the commerce of Germany.

Principal cities

1. Their rapid growth

Naturally, in a country making such rapid advances, the cities have grown also, as has been the case in the United States. In the twenty years between 1870 and 1890, for example, Berlin had a more rapid growth than New York, and added as many new residents as Chicago. In 1875 Boston had almost a hundred thousand more people than Hamburg; but now Hamburg has over two hundred and sixty-one thousand more than Boston. These and other German cities are still rapidly increasing in size.

2. Berlin

(1) *Its location*

The position of Berlin, on the small Spree River (Fig. 425) on the North German plain, midway between the coast and the highlands, may not at first seem a very favorable one. However, the Oder, a large river, and some of the tributaries of the Elbe approach so near each other in this section that they have easily been connected by canal. Thus, Berlin has water connection with both Hamburg and Stettin, two important seaports, and with all parts of these two river systems. This is a very important aid in bringing fuel, food, and raw materials for manufacture, and in taking away manufactured articles.

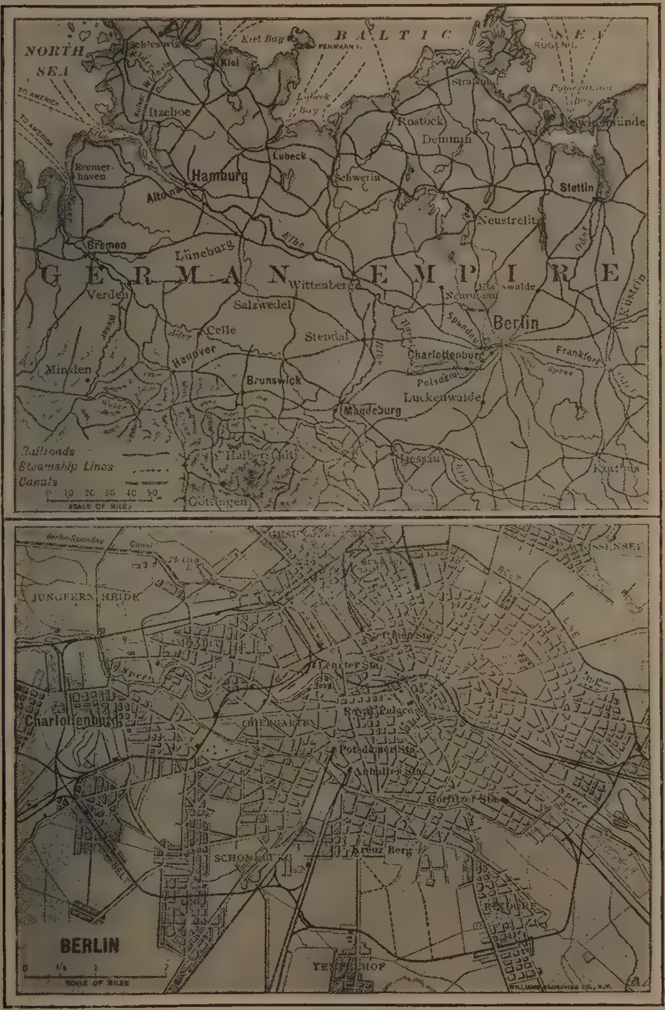


Fig. 425. — Berlin and vicinity.

Observe also (Fig. 416) that Berlin lies on the direct route from Hamburg to Breslau, and from Stettin to Leipzig, and that other large cities surround it. It is, moreover, on the route of several of the chief European railways, and is therefore one of the leading railway centers of the continent.

(2) *Its importance*

With such excellent connections, by water and by rail, Berlin has become one of the principal manufacturing cities of the empire. Fully half the residents are supported by manufacturing, which includes brewing, the making of fancy articles, clothing, machinery, etc. Besides being the capital of Prussia and of the German Empire, Berlin is the center of German banking. It is noted for its art and music, and for its great university, the largest in the empire. There are a number of suburbs, one being Potsdam (Fig. 425), the German "Versailles," in which are located several royal palaces.

3. Interior cities near Berlin

(1) *Leipzig*

Among the cities not far from Berlin is Leipzig, the fifth in size in the empire. It is situated at the junction of two small streams, at a point where roads from the highland meet those from the lowland. Formerly it was at the crossing of important wagon roads, and now it has become a railway center. Owing to its favorable position, Leipzig is, next to Berlin, the most important trade center of Germany. One of its leading articles of commerce is fur. It is the seat of a noted university, and a center for the German book trade.

(2) *Dresden*

Dresden, southeast of Leipzig, is noted for its art museum (Fig. 426), which rivals the Louvre of Paris. The beautiful Dresden china is made in this vicinity, and in recent years much manufacturing has developed; for Dresden is situated on the navigable Elbe and has coal near at hand. It is, moreover, the capital of Saxony, the most densely settled German state.

(3) *Chemnitz, Halle, and Magdeburg*

Chemnitz, near by, has important textile industries. Halle and Magdeburg, farther to the northwest, and in the center of the chief beet-growing section, are extensively engaged in the manufacture of sugar.

(4) *Breslau*

Breslau, a city not much smaller than Leipzig, is on the Oder, a navigable river. It has the advantage of being near a very rich coal and iron field, and is, therefore, a great manufacturing center. Its situation, near the Russian frontier, makes it an important market for eastern and central Europe.

4. Munich and Nuremberg

In the highland of South Germany is Munich, the capital of the kingdom of Bavaria. Although so far to the south, and so distant from coal, Munich is the third city in size in the realm. It is on the trade routes from Germany to Italy and to Austria, and is accordingly an important railway center. Much of its renown is due to its art collections and its art industries, such as work in bronze, gold, silver, glass painting, and porcelain manufacturing.

North of Munich, on the road to Berlin, is Nuremberg. This quaint city was famous in former centuries for its art and architecture, and many of its treasures are still carefully preserved. At present it is an important center for the manufacture of toys.

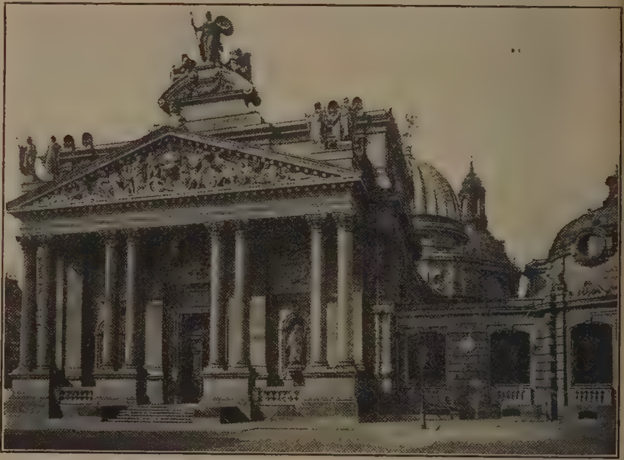


Fig. 426. — The Dresden Art Museum which contains many treasures of art.

5. Seaports

Hamburg, which is growing so rapidly in population, is the second city in Germany and the most important seaport on the continent. The reasons for this are clear when it is known that the estuary of the Elbe (Fig. 425) makes an excellent harbor, usually free from ice, and that Germany has an extensive foreign trade. Name some articles from the United States that probably enter this port. What water connections has Hamburg with the interior?

Bremen and Stettin also admit large vessels, and are the chief rivals of Hamburg; but they together have less than one half as much commerce as Hamburg. In what respects is the situation of Hamburg more favorable to commerce than that of Bremen and Stettin? Name other Baltic ports besides Stettin. Which is a natural outlet for wheat from Russian Poland? Estimate the distance saved to the Baltic ports by the cutting of the Kaiser Wilhelm canal, south of Denmark, which is sixty-one miles in length. What city is at the eastern end of this canal?

6. Cities along the Rhine River

(1) *Cologne and vicinity*

On ascending the Rhine into Germany we come to the great manufacturing region, already mentioned (p. 312). What cities are found there? COLOGNE, the largest, with a population of over half a million, is on the river bank. It is a great shipping point, since railways cross the river, and boats from London and other places are able to ascend to this point.

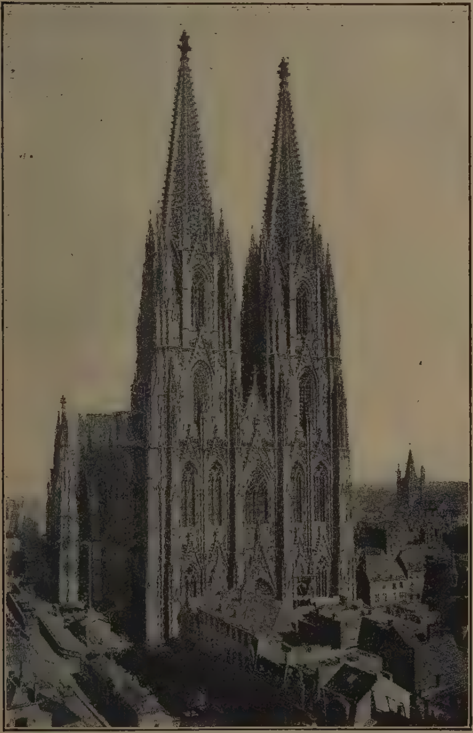


FIG. 427. — The Cologne Cathedral, one of the most famous churches in Europe.

Near Cologne are ELBERFELD and BARMEN, which have textile manufactories; ESSEN, which is famous for the Krupp steel works; KREFELD, which is an important silk-manufacturing town; and AACHEN (Aix-la-Chapelle in French) which manufactures woolen cloth.

(2) *Frankfurt*

Just beyond the chief bend in the Rhine is FRANKFURT, on a navigable tributary, the Main. The easiest route from the Rhine Valley to the Danube lies along this tributary; and, since the railway from the German plain to the upper Rhine passes Frankfurt, this city is a center of important trade routes. For this reason it is one of the chief trading and banking centers in Germany. It has long been prominent, and was the capital of the old German Confederation (p. 308).

The Rhine River compared with the Hudson

1. In scenery

The Rhine, the most important river in Germany, is often compared with the Hudson. In both rivers there are sections that are shut in by high, rocky cliffs, well wooded to the top. The Rhine, however, is much narrower than the Hudson, so that these walls seem loftier; and since the stream is more winding, they often stand out boldly, as if in the very path of boats, to bar their further progress.

When one journeys along the more beautiful portion of the Rhine, a fine old castle often comes into view, as a turn in the river course reveals an especially bold cliff. Sometimes several such reminders of the past may be seen from a single point on the river. Many of these are in ruins, but now and then one is seen that is still kept up as a residence. The Hudson lacks such castles, although there are many magnificent residences along its lower course.

There are many terraced vineyards on the sloping hillsides bordering the Rhine (Fig. 421), and likewise many a quaint village built on a narrow strip of flood-plain between the river and the cliff (Fig. 429). Since the Rhine receives more large tributaries than the Hudson, there are more wild glens on the sides, and more broad, wooded valleys, which open up charming views from the river. The openings in the valley walls, where these tributaries enter, are favorite sites for towns.

2. In distribution of population along its course

In regard to the distribution of cities along its banks, the Rhine offers still further contrast to the Hudson. The latter has a large population at only two points; namely, near its mouth, where there

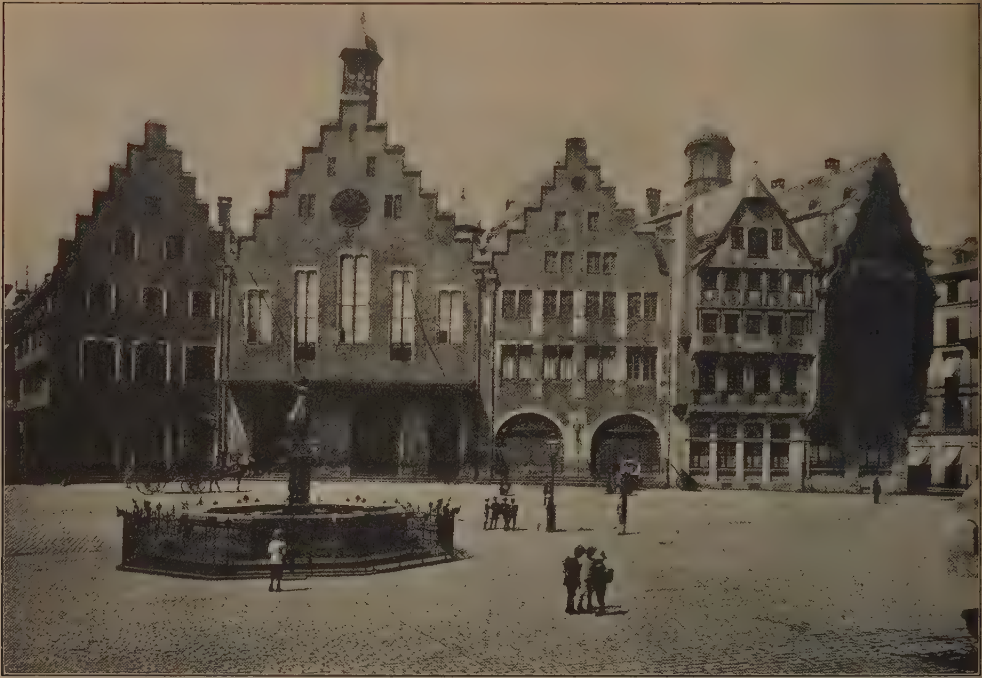


FIG. 428. — Some of the quaint houses in the ancient city of Frankfurt.

are millions of people, and about one hundred and fifty miles above the mouth, where Albany, Troy, and Cohoes are situated. Between Yonkers, just above New York City, and Albany, there is not a city with thirty thousand inhabitants. The Rhine, on the other hand, while having no enormous collection of people at any one point, has many populous cities along its course. Name several. What have you already learned about Rotterdam at its mouth? How does it compare with New York City in size?

Review Questions 1. What is the position of Germany? Explain its advantages. 2. What about the formation of the empire; its present area and population? 3. State the chief facts about the government. 4. Why is the boundary line so

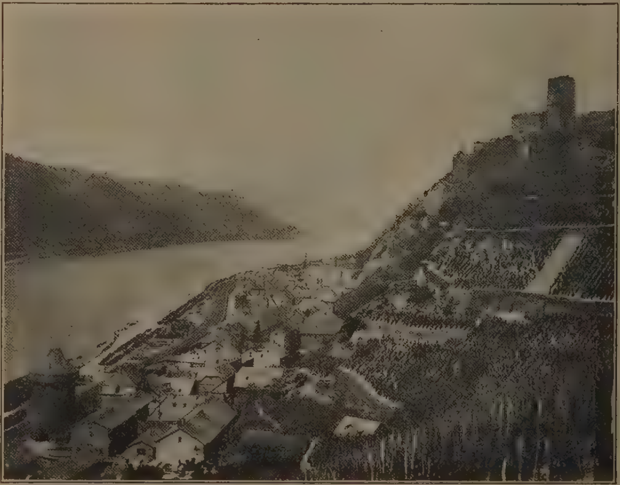


FIG. 429. — The Rhine, with a village, a vineyard, and an old castle on the right.

irregular? 5. Show how preparation for war has played a part in German History. 6. Describe the highlands. 7. The lowlands. 8. The drainage. 9. Tell what you can about the temperature; the rainfall. 10. What is the condition of lumbering? 11. What are the leading agricultural products? 12. What are the principal mineral products? 13. State the importance of manufacturing; and locate the leading manufacturing centers. 14. Name the principal kinds of manufacturing. 15. How has Germany advanced in recent years? Give some reasons for it. 16. What can you tell about the rapid growth of the cities? 17. State the principal facts about Berlin. 18. Leipzig. 19. Dresden. 20. Chemnitz, Halle, and Magdeburg. 21. Breslau. 22. Munich and Nuremberg. 23. The seaports. 24. The cities along the Rhine. 25. Name and locate the principal cities of Germany. 26. Compare the Rhine River with the Hudson in scenery. 27. In distribution of population along its course.

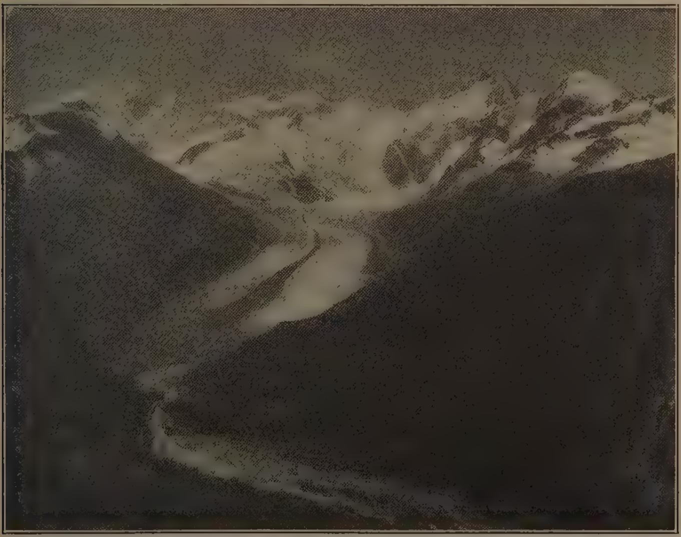


FIG. 430. — Snow-covered mountains with a glacier extending from them down one of the Alpine valleys.

Suggestions

1. Find in an atlas in what parts of the empire the larger states, such as Prussia, Bavaria, Saxony, etc., are situated. 2. People often assert that the peace of Europe is preserved by careful preparation for war; in what sense can this be true? 3. What must be some of the benefits of two years of active training in the army, aside from preparation for war? What are some of the disadvantages? What relation has this to emigration? 4. What is the size of our standing army? Why so small? 5. What seaports of Europe most nearly approach Hamburg in size? 6. How might the Kaiser Wilhelm Canal possibly prove an injury to Hamburg? 7. Show that Germany resembles Great Britain in her industries, while differing greatly from Russia and Norway. 8. Find out something about Goethe; Schiller; Humboldt; Emperor William the First; Bismarck; Von Moltke; Wagner; Schumann.

IX. SWITZERLAND (Fig. 390)

Map Study

1. What countries surround Switzerland (Fig. 358)? 2. What mountains extend along the boundaries of Switzerland? 3. Which of the boundaries is least mountainous? 4. What large rivers rise among the Alps? In what direction does each flow? 5. There are many lakes among the Alps (Fig. 416). What does their abundance suggest? 6. How does the area of Switzerland compare with that of your own state?

Surface features

This is a very mountainous country (Figs. 430 and 434), for the Jura Mountains are on the northwestern border, while the Alps occupy the southern half. Between these two mountain systems, which extend northeast and southwest, is a low, hilly plateau, from one to two thousand feet in altitude. About one third of Switzerland is included in the plateau belt.

Climate

1. Temperature

It is evident that the climate of this mountainous country must be cool, and that there must be great differences in temperature according to the altitude. At the base of the Alps, chestnut and walnut trees grow; higher up, these give place to the beech, maple, and other trees of the cool temperate zones; and still higher is a belt of evergreens. Above these come dwarfed trees, shrubs, and grass; and higher still, at an average elevation of about nine thousand feet, the snow line is reached.

2. Rainfall and the formation of glaciers

The lofty Alps, rising in the path of the prevailing west winds, cause Switzerland to be one of the wettest countries on the continent. On the higher mountains much snow falls; and, sliding down the mountain sides in the form of avalanches, it gathers in the valleys to produce streams of ice, or *glaciers* (Fig. 430). These move slowly down the valleys until they reach a point, below the snow line, where the ice melts. The Rhone and other rivers are supplied with water by the melting of the Alpine glaciers.

People and government

In so rugged a country one would hardly expect a large population; yet Switzerland is almost as densely settled as France, and much more so than the state of New York.

People who dwell among mountains develop a spirit of independence, as is illustrated by the story of William Tell. Thus we find that, as early as 1291, an agreement was made among a few of the small Swiss states, or *cantons*, to unite for protection. Many a time since then other nations have tried to conquer the Swiss; but, aided by the difficult approaches to their country, and by the mountain strongholds to which they could retreat, the Swiss have been able to maintain their freedom. Yet the area of the entire country is only one third that of Pennsylvania. Their twenty-two cantons, united somewhat as are our states, now form a republic whose independence the Great Powers of Europe have agreed to maintain.

Languages

Although the Swiss have a stable government, they lack a common language. The country is most open toward the north, for there the plateau of Switzerland merges into that of Germany. Naturally, therefore, the influence of Germany has spread into Switzerland, and German-speaking people are most numerous, making up over one half of the population. The approach from France is much more difficult, and the French population forms less than one fourth of the whole, while the remainder speak Italian.

Agriculture

Owing to the mountainous condition, only one acre in nine is fit for the plow. Yet agriculture is the principal industry. On the lower lands grain, potatoes, grapes, and the mulberry tree are raised, as in the neighboring countries; and on the lower mountain slopes dairy farming is important, as might be expected. Here cattle and goats are raised, being driven to higher pastures as the snows melt from the mountain sides. The population is so dense, however, that much food must be imported; but cheese and condensed milk, made from farm products, are exported.

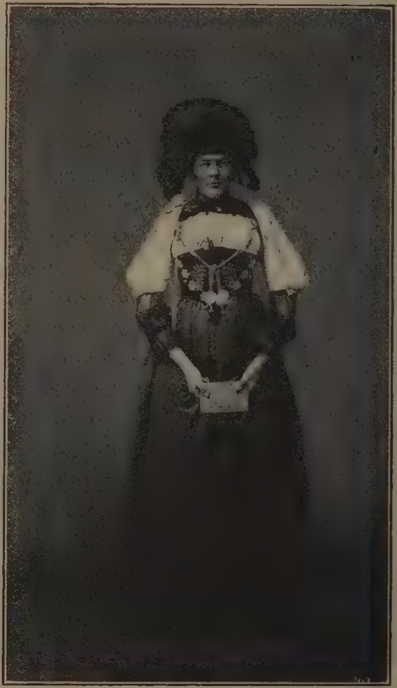


FIG. 431. — A Swiss peasant girl in native costume.

Switzerland is very poor in mineral de-

FIG. 432. — Cattle on the slopes of the Alps.

posits, and there is very little coal. Such a scarcity of raw materials would suggest that there is little manufacturing; but this is not the case, for in spite of the absence of coal, ore deposits, and cotton, the Swiss have developed extensive manufacturing. Like the New Englanders, they make light articles mainly, such as jewelry and textile goods, especially silk. They also do much wood carving.

Mining and manufacturing

There are several reasons why manufacturing is so highly developed. Although coal is wanting, there is abundant water power, supplied by the swift mountain streams, which are fed by the melting snows. The Swiss are taking a leading place in the use of such power, by means of electricity.

Reasons for so much manufacturing

1. Water power

They are unusually skillful mechanics, too, a fact that is proved by the remarkable wood carving for which they have long been noted.

2. Skill

The Swiss are further favored by their central position; for they are surrounded by densely populated countries which supply raw materials and furnish a market for manufactured goods.

3. Central location

Finally, their roads and railways are remarkably developed. One might think that it would be very difficult to transport goods in such a country. In fact it would be, if the Swiss had not taken special pains to overcome the difficulties; but the very fact that nature has made transportation so difficult, has led the people to build the best of highways. No country in the world has better roads than Switzerland.

4. Roads and railways

Railroads pierce the mountains in several directions, connecting Switzerland with foreign countries.

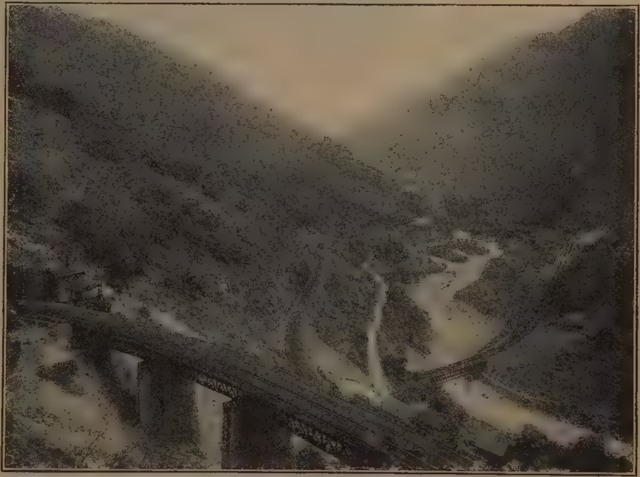


FIG. 433. — The St. Gothard Railway on the south side of the Alps. Here are seen three tracks one above the other, for at this point the railway enters the mountain, swings in two great circles, coming out each time at a higher level.

One of the most important is the St. Gothard Railway, which connects Switzerland with Italy by the St. Gothard Tunnel. This is one of the longest tunnels in the world, and is a marvel of engineering skill. Before reaching the main tunnel, in traveling north, several smaller ones are entered, through which the train winds in a circular course. A passenger twice comes out of the mountain almost directly over the point where he entered it. There, far below him, he can see the two places at which the train entered (Fig. 433). Such winding tunnels are necessary, because the grade is so steep that a train could not be drawn directly up a straight track. The main tunnel, which is nine and one fourth miles long, is quite straight. The *Simplon Tunnel*, even longer than the St. Gothard, now pierces the Alps a short distance farther west.

Leading cities

ZURICH, the largest city in Switzerland, is situated on Lake Zurich. It is an important railway center, being connected with Italy by the St. Gothard Railway, while other railways bring it in touch with France, Germany, and Austria. These railroads are especially important in bringing foods, as well as silk and other raw materials, for manufacture. Therefore Zurich is the center of one of the principal manufacturing districts. It is noted for the manufacture of silks, cotton, and machinery.

BASEL, the second largest city in Switzerland, is the busiest railway center in the country. It is on the main line of the St. Gothard Railway, and on the Rhine at the point where it enters Germany from Switzerland. Why is its position, near both France and Germany, favorable to manufacturing?

GENEVA, situated on the lower end of Lake Geneva, near where the Rhone enters France, is the third city of the Republic, and a noted educational center. It is on a very ancient and important trade route from the Mediterranean to Germany (p. 290), and has excellent railway connections. There is much manufacturing, among the important articles made being jewelry and scientific instruments.

BERNE, the capital, is centrally located; but it is a small city because it is not favorably situated for commerce.

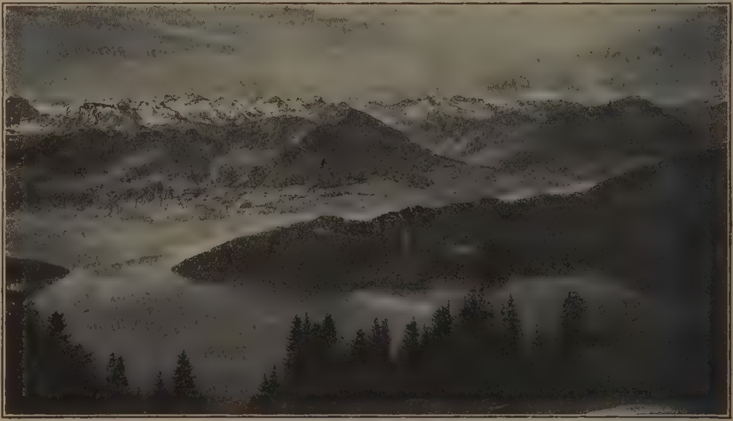


FIG. 434. — The snow-capped Alps as seen from Mount Pilatus, with Lake Lucerne in the foreground.

Scenery and tourists

Many of the Swiss cities and towns are beautifully situated upon lakes, and within sight of mountain peaks always covered with snow. LUCERNE, for example, is surrounded by grand and varied scenery. The city is located upon Lake Lucerne, and lofty mountains rise close at hand (Fig. 434). Mounts Rigi and Pilatus are near by, and from their summits one obtains magnificent views of the lake, over four thousand feet below, bordered by green meadows and numerous villages. In several directions, as far as the eye can reach, are the snow-covered crests of stupendous, jagged mountains.

On account of such scenery Switzerland is the most noted summer resort of Europe; and the entertainment of visitors is one of the leading occupations of the Swiss people. There are so many hotels and fine roads, that one can easily go almost anywhere. It is possible even to reach the tops of several of the mountains by rail. Every summer many Americans cross the ocean to enjoy the Swiss scenery.

Review Questions 1. Describe the surface of Switzerland. 2. The climate. 3. State the chief facts about the people and the government. 4. What about the languages? 5. State the principal facts about agriculture. 6. About mining and manufacturing. 7. Give several reasons why manufacturing is so well developed. 8. Locate and state the main facts about Zurich. 9. Basel. 10. Geneva and Berne. 11. Why is Switzerland so attractive to tourists?

Suggestions 1. How may the lakes filter and regulate the rivers? 2. What reasons are there for giving particular attention to the study of English and other foreign languages in the Swiss schools? 3. Why has Switzerland, unlike many European countries, not come into possession of colonies? 4. Find the meaning of "referendum" and "popular initiative" in Swiss legislation. 5. Switzerland has long been selected as a place of refuge for persecuted people and political refugees from other nations. Why? 6. Read that portion of the story of William Tell which is supposed to have occurred about Lake Lucerne. 7. Find out where Louis Agassiz was born; where he later lived; and what he did to prove his theory of the Great Ice Age.

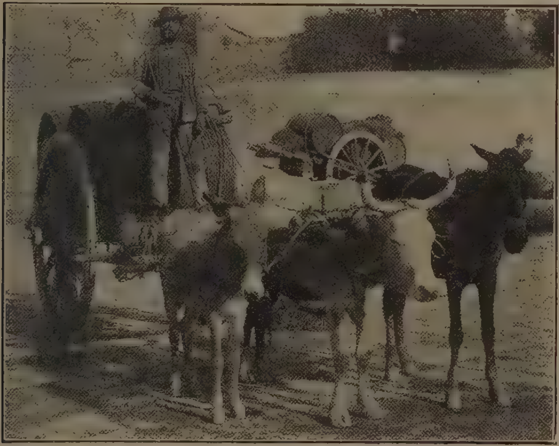


FIG. 435.—A team in Naples consisting of a horse, a cow, and a donkey.

X. ITALY (Fig. 416)

Map Study 1. The shape of Italy reminds you of what object (Fig. 416)? 2. How does its latitude compare with that of Spain? 3. What neighboring islands belong to it? 4. Point out the principal river. 5. How are the lofty mountains in the north likely to affect the climate farther south? 6. What countries border Italy? 7. What seas border it? 8. How does its position seem to be favorable for commerce?

Its area and population The area of Italy, including the islands of Sicily and Sardinia, is only a little greater than that of Colorado; but its population is over thirty-four million. It is the smallest of the six Great Powers, but is the most densely settled of any except the United Kingdom. Name the other Great Powers.

Importance of its position The position of Italy is a very favorable one. It lies in the midst of the Mediterranean, whose shores are densely populated. What country in Africa lies nearest to Italy (Fig. 495)? Estimate the distance to it. How far is it from Italy to the Suez Canal (Fig. 455)?

It has been said that Italy is "the very heart of the Mediterranean lands, and plays a great part as a link in the chain of communication between northwestern Europe and the Far East." For example, mails from London to India are carried by water to the western coast of continental Europe, and then go overland to Brindisi, and thence by steamer. From this it is plain that Italy's central position is an advantage for trade with Africa and Asia, as well as with southern Europe.

People and government The inhabitants of Italy are a mixture of many peoples. In early times, the central position of the peninsula was of importance in aiding Rome to control the lands bordering on the Mediterranean Sea. At that time people from the surrounding lands of Europe, Asia, and Africa were brought to the peninsula, often as slaves captured in war. Later, when the power of the Roman Empire was weakened, hordes of barbarians invaded Italy from central Europe.

For centuries after this, Italy was broken up into a number of independent states. In 1860, however, several of these states united to form the Kingdom of Italy. Later others were added, until in 1870, or about the time that the German Empire was formed (p. 308), the present kingdom was established, with ROME as its capital. Like most of the European countries, Italy is governed by a limited, or constitutional, monarchy.

Surface features

Throughout most of its extent, the Italian peninsula is mountainous. In the north are the Alps, some of whose highest peaks are on the boundary between Italy and Switzerland. The Alpine ranges curve around in northwestern Italy and join the Apennines, which extend the entire length of the peninsula and form its very backbone. The principal lowlands, therefore, are the narrow coastal plains and the broad Po Valley. There are also many small, fertile valleys among the mountains.

Climate

1. Temperature

We think of Italy as a sunny land of flowers, although Milan and Venice are in nearly the same latitude as Montreal. One reason for the pleasant Italian climate is that the lofty Alps form a wall which cuts off the cold north winds. Another reason is that the temperature is greatly influenced by the Mediterranean Sea, whose waters do not freeze even in winter. On these accounts the Italian winters are mild; and in the extreme south the temperature seldom falls to the freezing point.

2. Rainfall

Much of Italy has an abundance of rain; but everywhere, except in the north, the greater part comes in winter. The summer drought is due to the fact that the horse-latitude belt moves northward in summer and covers Italy (p. 209); therefore at that season the climate of southern Italy resembles that of southern Spain.

Agriculture

Such a climate, together with a fertile soil, helps to explain why agriculture is the principal industry of Italy.

FIG. 436.—Lago di Garda, one of the Italian lakes on the southern side of the Alps. Here are found groves of lemon trees along the shores of the lake.

1. Extent of irrigation, with reasons

The most extensive farming district is the fertile plain of the Po Valley. There is an abundance of rain here; yet the people depend upon irrigation more than in most other parts of Europe. There are several reasons for this. In the first place, the tributaries of the Po, fed by the rains, snows, and glaciers of the mountains, furnish a steady supply of water to the gently sloping land. Besides this, the rivers frequently flow through lakes — some of them among the most beautiful in the world (Fig. 436) — which act as great reservoirs for water supply. This tends further to furnish a regular supply.

In the second place, better crops can be raised by irrigation than without it, partly because the flooding of the land fertilizes the soil, and partly because with irrigation there can be no drought. By the aid of irrigation, from four to ten crops may be raised in a year.

2. Agricultural products

Among the products are many that thrive in semi-tropical climates, as well as others that are common in northern Europe. Where irrigation is so easy, the extensive cultivation of rice is possible. This is an important crop in northern Italy; but corn and wheat are raised in still greater quantities. Grapes are grown to such an extent that Italy ranks first among the wine-producing countries of the world; and so many silk worms are reared that raw silk is the most valuable export. Among the other important products are eggs, which are exported in large quantities; also olives, oranges, lemons, flax, hemp, and wool.

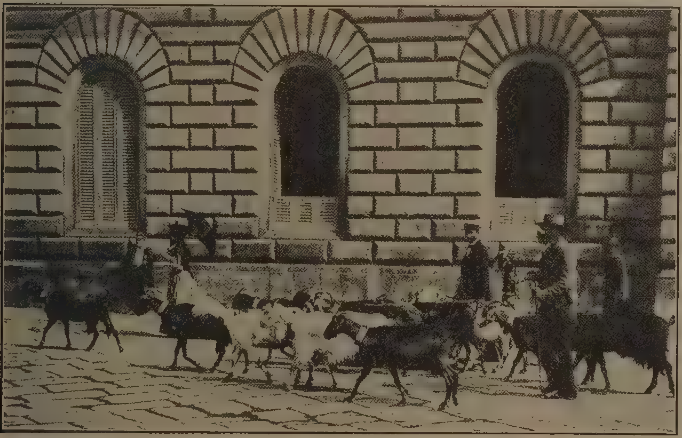


Fig. 437. — A herd of goats in the streets of Naples. They are driven from door to door, and milked whenever the customers wish to buy the milk.

On some of the slopes forests are grown, but most of the natural forest was cut off long ago. Among the useful trees is the chestnut, which is planted in groves for the nuts, that serve as an important food. The Italian chestnut is much larger than ours, and is ground up into a kind of meal, as wheat is ground into flour.

Among the mountains there is much natural pasture, to which herds of sheep and goats are driven in summer. Many goats are raised in Italy for their milk, and they are even driven into the cities, and milked at the doors of the customers (Fig. 437).

3. Important drawback to agriculture

One great drawback to the proper development of agriculture in Italy is the presence of broad, marshy tracts infested with mosquitoes, whose bite causes malaria. This is especially true in the southern half of the country, and there, even with fertile soil and a warm climate, large tracts of land have had to be abandoned. One sixth of the population suffers from malaria, and there are thousands of deaths from that disease every year. It is not to be wondered at that the Italian government is attempting to stamp out this dread disease.

Fishing and mining

The fishing industry is important. Among the peculiar products of the sea are precious coral and sponges. You will remember that we found sponge fishing important also among the Bahama Islands east of Florida.

In Italy there is a general lack of valuable mineral deposits. Except in the island of Elba there is almost no iron; and no coal of value is found in the kingdom. Indeed coal, wheat, and cotton are the leading imports. There is a little zinc and copper ore; but one of the most important mineral products is the sulphur of Sicily. Another mineral product is the pure white Carrara marble, of such rare beauty that it is prized the world over.

Manufacturing

As in Switzerland, water power supplies the place of coal to some extent, often being used to produce electricity. There is, therefore, more manufacturing than one might infer from the lack of fuel. While much raw silk is produced, and there is some silk manufacturing, a large part of the raw silk is sent to France, Switzerland, and elsewhere, to be made into cloth. There are also factories for woolen, cotton, and flax weaving, and for other purposes.

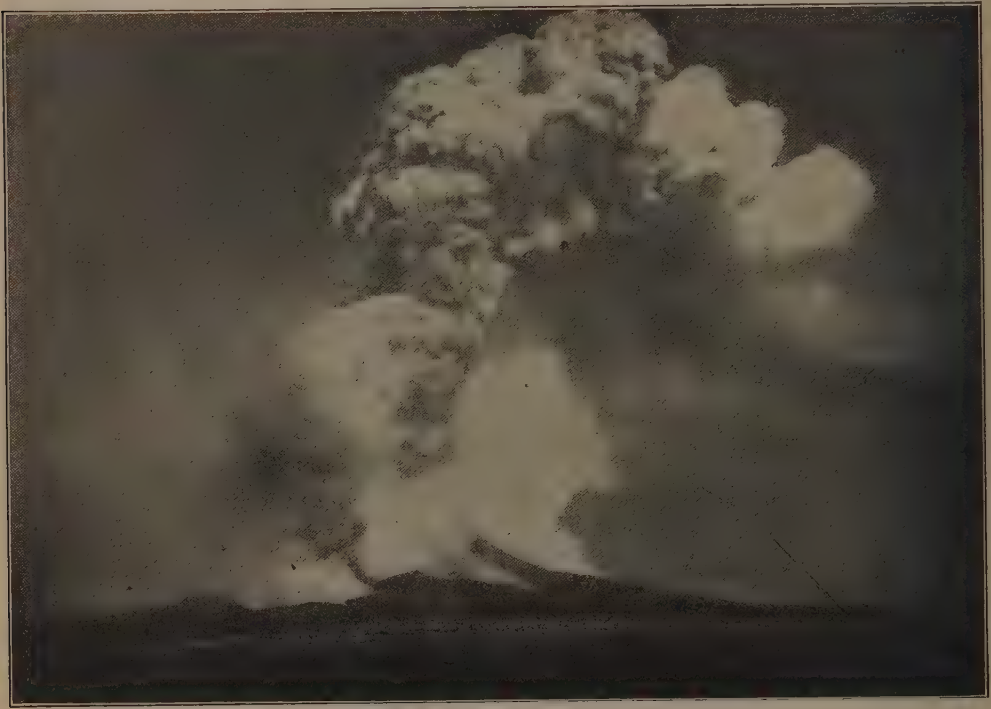


FIG. 438. — Vesuvius in eruption (1892). A great column of steam and ash rises above the volcano; while streams of liquid rock, or lava, are flowing down its slopes.

Most European countries take pride in their fine art museums; but Italy far surpasses them all. It is the very storehouse of art, whether architecture, painting, or sculpture be considered. Because of the artistic tastes of the Italians, many of their manufactured articles are of an artistic nature. Among their manufactures are glass work, lace making, earthenware manufacture, the making of statuary, wood carving, coral carving, and straw plaiting. In what other country have we found that the artistic taste of the people greatly affects their manufactures (p. 285)?

Estimate the average width of the Italian peninsula. Since it has many excellent harbors, we may expect to find numerous large cities along the coast, as in Great Britain. But it is different in the interior, for in so small and mountainous a country, with no coal and iron, there is less reason to expect large cities there.

Principal cities in the south

1. Naples and vicinity

(1) *Beauty of its location*

The most populous city is NAPLES, in the southern part of the peninsula. The semicircular Bay of Naples, on which it is situated, presents a most magnificent sight. On the north side, near the head of the bay, is the city itself, rising, street above street, upon the slopes of some low hills. Toward the east is Mount Vesuvius (Fig. 438), with the crests of the Apennines in the distance. And on the south side of the bay is a steep, rocky coast, behind which are numerous villages, partly hidden among groves of orange, lemon, and olive trees. All around the bay is a succession of towns and villages.

(2) Reasons for the dense population here

This is one of the most densely settled regions in Europe. There are several reasons for this. One is the fact that the land here is especially fertile, having been made so by the decay of the volcanic ashes that have been thrown out of Vesuvius. The climate is also favorable to the growth of crops, and therefore the region around the bay supports a dense agricultural population. The harbor, too, is good, so that there is more shipping here than in any other Italian port, with the single exception of Genoa.

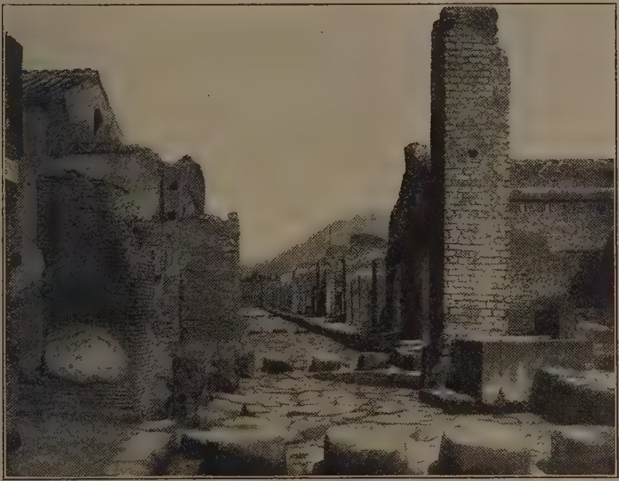


FIG. 439. — A street in Pompeii. Even the tops of the houses were buried beneath volcanic ash which was erupted from Vesuvius (seen in the background) in the year 79.

The reason for so large a city, and for so many towns and villages in this agricultural region, is found partly in the peculiar character of the Italians. They feel a dread of isolated homes, such as are common in the farming district of the United States. Instead, therefore, of living in scattered houses on farms, they crowd into the villages and cities. They do this, too, even though they must travel a long distance to their fields of work, or must suffer now and then from extreme want.

(3) Mount Vesuvius; its history and attractions

Within plain sight of Naples stands Mount Vesuvius, a cone of lava and ashes nearly a mile in height, from whose crater volumes of steam constantly pour forth. At the time of Christ the slopes of this mountain were dotted with productive farms, while thriving towns spread over the country at its base. But in the year 79 a terrible eruption took place which completely buried Pompeii, Herculaneum, and many villages, beneath showers of ashes and streams of volcanic mud. Since then Vesuvius has been in eruption many times, the last violent outbreak occurring in 1906.

During the last century the buried city of Pompeii has been uncovered at great labor and cost. By these excavations much has been learned about the buildings and customs of the people who lived here at the time of Christ. One can walk along these deserted streets (Fig. 439), and wander among the ruined homes from which the people were driven forth on that terrible day, nearly two thousand years ago.

At present, tourists are able to go to the summit of Vesuvius almost any day. There they see one of the most awful sights in the world, when they cautiously approach to the very edge of the crater — an opening perhaps a quarter of a mile across — and peer down into the abyss. Sometimes reports like the thunderings of cannon come from far below, and lumps of white-hot lava, several feet in diameter, are hurled upward. At times lava lumps are thrown above the mouth of the opening and fall here and there outside, making one's visit full of excitement.

2. Palermo

The principal city south of Naples is PALERMO, the capital of Sicily. It is situated in the midst of extensive vineyards and fruit groves. What fruits would you expect to find there?

Rome

1. Advantages of its location

The site of Rome was well chosen. It lies near the center of the Mediterranean and near the center of the Italian peninsula as well. In that part of Italy the fertile coastal plains are broad, and are crossed by the Tiber, the largest river of the country except the Po. In that vicinity, also, the Apennines reach their greatest height, which insures abundant water supply for the Tiber and for irrigation on the plains. Moreover, the valley of the Tiber offers one of the most convenient routes across the peninsula. These are some of the advantages that attracted to ancient Rome a population of fully a million, and caused the surrounding country to be thickly settled and carefully tilled.

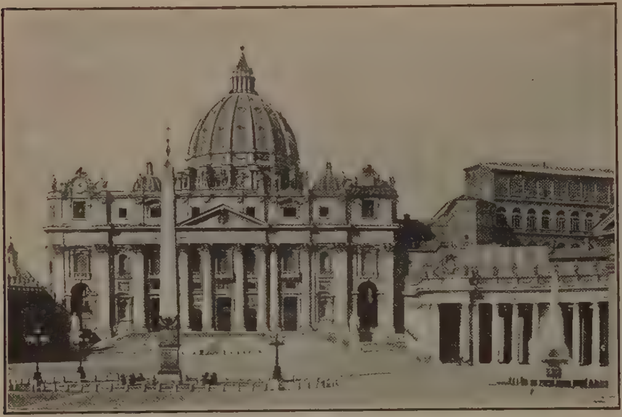


Fig. 440. — St. Peter's Cathedral (on the left) and the Vatican (on the right) in Rome.

2. Influence of malaria Now, however, the city contains about half as many inhabitants, while the neighboring plains, for miles around, though beautiful pasture land, have scarcely a tree or a house upon them. Because of the dread malaria, people shun this region, and at present much of the country is used only for grazing. As summer approaches, even the herdsmen flee with their cattle and sheep to the mountains.

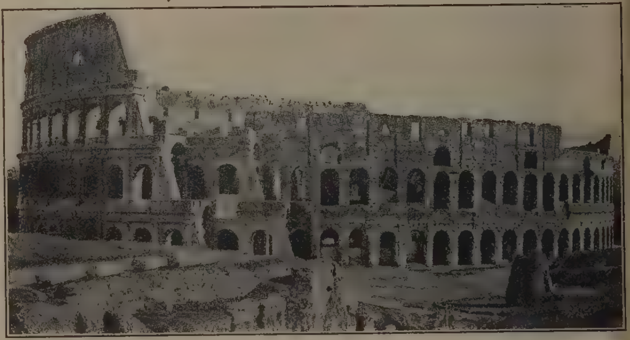


Fig. 441. — The Colosseum, one of the ruins of ancient Rome.

3. Its attractions Although agriculture and commerce do not flourish near Rome, fine residences, public buildings, art galleries, and notable ruins are numerous in the city. The dome of *St. Peter's* — the largest and most famous church in the world — towers above everything else; and the *Vatican*, where the Pope resides, is the most noted palace in Christendom (Fig. 440). In the Vatican are some of the finest and most beautiful of Michael Angelo's paintings.

The ruins of ancient Rome, which rival in interest these works of later days, cover so many acres that the city is almost as much a tomb as a living city. One of the most notable relics of the past is the *Colosseum* (Fig. 441), a huge, oval-shaped amphitheater, open to the sky, with seats for forty or fifty thousand persons. In the days of the Roman Empire it was used to witness life-and-death struggles between men, and between men and wild beasts.

The *Forum* is another extensive ruin within the city limits. It was the great public square, on a lowland among some low hills; but its monuments, arches, and other ornaments became covered with rubbish during the centuries that followed the fall of the Roman Empire. The excavation of this famous spot has not yet been completed, whole buildings, as well as smaller objects, having been buried in that locality.

Principal cities in the north

1. Florence

With the exception of Rome and Naples the large cities of the Italian peninsula are in the northern part. The first one north of Rome is FLORENCE, on the western base of the Apennines, at a junction of roads across the mountains. Straw plaiting, mosaic work, and silk manufacturing are important Florentine industries. Florence is famous for its art galleries, which are among the best in the world.

2. Milan and Turin

MILAN, the leading city of northern Italy, owes its importance to its location at the crossing of routes of travel and commerce; one of these runs east and west in the Po Valley, the other north and south across the Alps. TURIN has flourished for a similar reason. From very early times these cities have been important trade centers because of their position at the crossing of trade routes in a fertile, densely populated valley. The railways recently built across the Alps (p. 321) have greatly increased their importance. They are busy manufacturing centers, making silk goods, cutlery, and other articles.

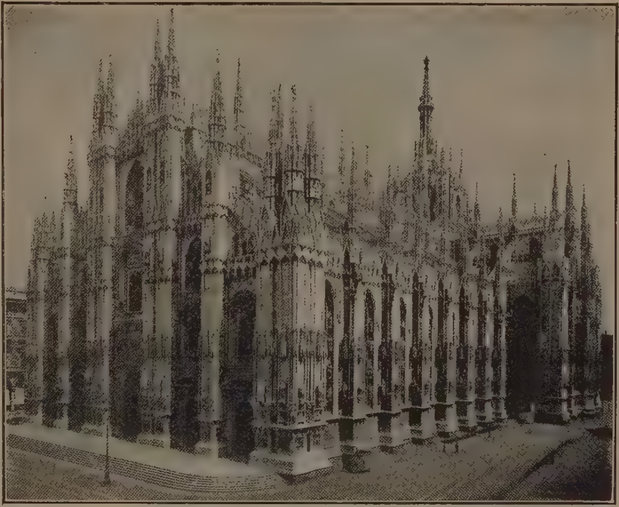


FIG. 442. — The Milan Cathedral.

FIG. 443. — One of the canals of Venice with a gondola floating upon it.

MILAN possesses a magnificent cathedral (Fig. 442), built of white marble, and adorned with more than a hundred spires and fully four thousand statues. On the wall of a former monastery at Milan is Da Vinci's famous painting, "The Last Supper," copies of which are seen in many of our homes.

3. Genoa

GENOA, although separated from the Po Valley by the low northern Apennines, is the natural seaport for Milan and Turin. Since it is a port of outlet for so fertile a region, and is now connected with central Europe by railway (p. 322), this city is the most important seaport in Italy.

The principal port on the Adriatic Sea is VENICE, one of the most interesting of European cities. When hordes of barba-

4. Venice

(1) *Its location and former importance*

rians were invading Italy, some of the inhabitants retreated to a number of small, marshy islands in a lagoon, protected from the sea waves by low sand bars. The descendants of these people developed into a hardy, independent race, largely through contact with the sea. Their very position forced them to become sailors; and the site of their city was favorable for commerce between central Europe and Asia. Protected from attack by land, Venice rose in power, and with power came wealth. Many beautiful houses, churches, palaces, and museums still remain to remind us of the ancient splendor of Venice.

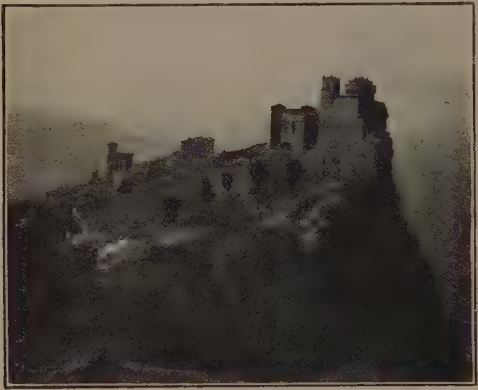


FIG. 444. — The citadel of the Republic of San Marino.

(2) *How the city is built*

The city is built upon more than a hundred small islands, about two and a half miles from the mainland, with which it is now connected by railway. Canals take the place of streets. There are one hundred and fifty canals, the main one, or Grand Canal, being bordered by fine residences built of white marble, whose doorsteps lead down into the water. Nearly four hundred bridges join the different islands, and there are many narrow footpaths; but since the chief thoroughfares are canals, *gondolas* (Fig. 443) take the place of wagons, carriages, and street cars. No doubt, thousands of children in that city have never seen a horse.

San Marino and Malta

San Marino, although surrounded by lands that belong to the Kingdom of Italy, is, like Andorra (p. 291), a tiny, independent republic. It is the oldest and smallest republic in the world, and owes its independence partly to the fact that the city is on a high, steep hill (Fig. 444) and, therefore, was difficult to capture.

South of Sicily is the small island of *Malta* (Fig. 358), which, like Gibraltar, belongs to Great Britain, and is strongly fortified.

Review Questions

1. Give facts about the area and population of Italy. 2. Explain the importance of its position. 3. Tell about the people, and the government. 4. Describe the surface features. 5. The climate. 6. Why is irrigation especially common in Italy? 7. Name the agricultural products. 8. How does malaria interfere with agriculture? 9. State the principal facts about fishing and mining. 10. Manufacturing. 11. Describe the beauty of the location of Naples. 12. State the reasons for the dense population here. 13. Tell about Mount Vesuvius; its history and attraction. 14. Locate Palermo. 15. State the advantages of the location of Rome. 16. What about malaria in its vicinity? 17. What are its present attractions? 18. Locate and state the principal facts about Florence. 19. Milan and Turin. 20. Genoa. 21. Venice. 22. San Marino and Malta.

Suggestions

1. Why should Italy have been much more important in former times than now? 2. What colonies has Italy in eastern Africa (Fig. 495)? Suggest reasons why Italy has so few colonies. 3. What must have been the influence upon Genoa and Venice of the discovery of the ocean route to India? Why? 4. What must have been the influence of the Suez Canal? Why? 5. Mention advantages and disadvantages of life in Venice. 6. Mention some of the uses of sulphur. 7. Make a post card collection of the different famous pictures of the Madonna. 8. Find out about the Catacombs of Rome; the Appian Road; the Aqueducts. 9. Ask some lawyer to tell you what influence Roman law has had upon our own law. 10. Find some facts about Cæsar, Cicero, Dante, Leonardo da Vinci, and Michael Angelo. 11. Where was Columbus born?

XI. AUSTRIA-HUNGARY (Fig. 416)

Map Study

1. Compare Austria-Hungary with Germany in area. 2. In population. 3. In number of large cities. In which country, therefore, would you expect to find the greater development? 4. How much of the boundary is formed by water (Fig. 416)? 5. What countries border this empire? 6. What portions are mountainous? 7. What about the variety of climate? 8. What sections do not belong to the Danube basin?

Surface features

Austria-Hungary is one of the most mountainous countries in Europe. It includes the eastern half of the Alps (Fig. 445), besides several other ranges. These mountains form a circle inclosing a broad level area (Fig. 359), called the Hungarian plain (Fig. 447), through which the Danube River flows. The encircling mountains are broken at only two points, — once near Vienna, where the Danube enters the Hungarian plain, and again on the southeastern boundary, where that river leaves it.

Climate

In so mountainous a country there are naturally many different kinds of climate. Everywhere except on the higher mountains, however, the temperature is favorable for the growth of grains and other crops of temperate latitudes. That is, the summers are warm and the winters are cold; but the difference between summer and winter is much greater than in England. Why?

The rainfall of the lowlands, which averages little over twenty inches, is barely enough for agriculture, and there are, therefore, occasional summer droughts in some places.

People

1. The mixture of races

There are many different kinds of people in this country, with very different customs and languages. For instance, about a fourth of the population, mainly in Austria, are of German stock. Magyars, descendants of Mongolian invaders, form over half of the population of Hungary. But races related to the Slavs of Russia are more numerous than either of these. There are also many Italians, as well as other peoples. German is the official language, and is spoken by the educated classes; but at least a dozen languages are spoken in the empire, and even two or three in a single town.

To be sure, a similar statement might be made in regard to the United States; for we also have a great variety of languages. But no matter from what part of the earth our citizens have come, they soon change their former customs, and become genuine Americans in spirit. The principal exception is the Chinese. The many peoples of Austria-Hungary resemble the Chinese in their tendency to remain apart. Their religions, languages, and customs are so different that it is difficult for them to agree. Therefore they are often jealous and suspicious of one another.

2. Reason for such a mixture

One reason for this mixture of peoples is the rugged country, with many inclosed valleys, in which the people have developed different customs. A second is that the empire has been increased in size by conquest. For example, note the country nearest Russia, north of the Carpathian Mountains. Here the boundary line cuts across a plain, instead of following mountains, as it does for a large part of its length. This plain is a part of the ancient Kingdom of Poland, which once stretched from the Baltic Sea to the Carpathian Mountains. When Poland was conquered and divided among Russia, Germany, and Austria (p. 307), this, the smallest portion, was Austria's share.

Fig. 445. — An Austrian village with mountains in the background.

A third reason for such a mixture of races is found in the central position of the empire. On that account people have entered it from various directions, and remained there. Thus it happens that Italians have pushed in from the southwest, Germans from the northwest, Russian Slavs from the north, and Magyars from the east.

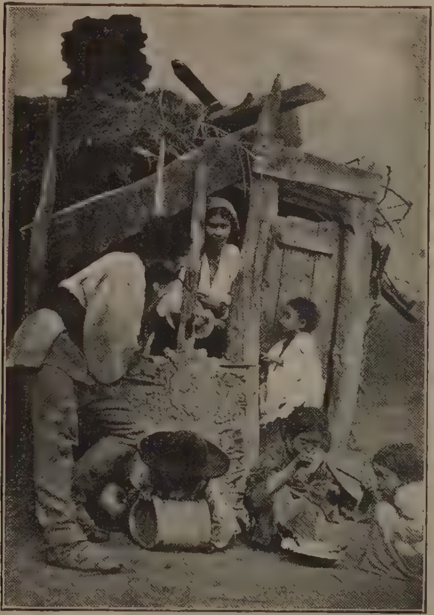


Fig. 446. — A family of gypsies and their house, in Austria.

Government

It has been a difficult matter to bring all these people under one government. Nevertheless, in 1867, the Austrian Empire and the Kingdom of Hungary were united, under Emperor Francis Joseph, to form the Empire of Austria-Hungary. Each of the countries has its own constitution, makes its own laws, and is independent of the other in most respects. But they work together in matters of common interest, such as the army and navy, foreign affairs, and finance.

Lumbering and agriculture

Many of the mountain slopes are forest-covered, and wild animals are still found in the remoter parts. Since nearly a third of the empire is wooded, lumbering forms one of the important industries.

Where the woods have been cleared away from the mountain slopes, there are pastures for sheep and goats. Cattle are also raised, especially on the lowlands.

Near the Adriatic, and in the warmer valleys, there are many vineyards; and the mulberry tree is raised to furnish food for the silkworm, as in Italy (p. 325) and southern France (p. 285). Flax, hemp, potatoes, sugar beets, and tobacco are other important crops. But the grains, especially wheat, rye, barley, oats, and corn, are the staple agricultural products of both Austria and Hungary. The broad plains of the Danube (Fig. 447) form one of the leading wheat-producing regions of Europe. So much wheat is raised that a large amount is exported.

Mining

There is much mineral wealth in the mountains, including deposits of salt, gold, silver, lead, mercury, and copper. There are also precious stones, such as the Hungarian opal, which is celebrated for its beauty. The excellent

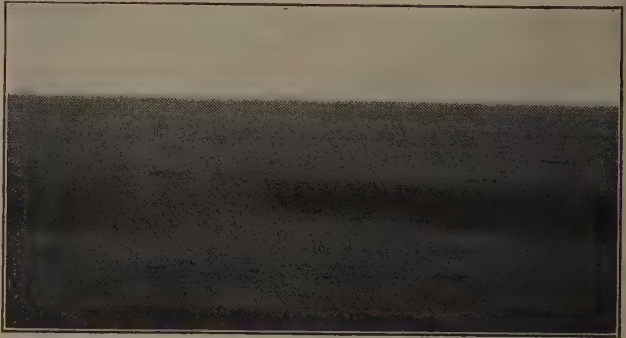


Fig. 447. — The broad, level Hungarian Plain, on which vast quantities of wheat are raised.

quality of the clays has made possible the manufacture of fine porcelain ware; and the mineral quartz supplies the material for the Bohemian glass blowers, who make some of the finest glassware in the world. This glass is beautifully colored by adding small quantities of mineral substances, such as silver, copper, and cobalt, which are mined in the country.

Iron ore is widely distributed; and Austria-Hungary ranks fourth among the coal-producing countries of Europe (Fig. 362). Some of the best deposits are in the northwest, near PRAGUE, which explains why that city is extensively engaged in iron manufacturing. Petroleum is also found in this empire.

Manufacturing

1. Its extent, and kinds

There is much less manufacturing in Austria-Hungary than in Great Britain, Germany, or France. Yet there are numerous cotton, woolen, flour, and paper mills, iron manufactories, and beet-sugar refineries. There is also much silk weaving. The chief manufacturing region is in the northwest, near Germany, while the principal agricultural sections are in the central and eastern parts.

2. Reasons for so little manufacturing

While there has been much progress in manufacturing in recent years, one reason for so little is found in the lack of education among the people. Much of the manufacturing is still done by hand, or by very simple machines.

Another reason for so little manufacturing is that conveniences for transportation are so poor. Since the Danube cuts through the mountains on both the east and the west side of the empire, the most natural trade routes lead either down this river into the Black Sea, or else northward and westward into Germany, and thence down the Elbe or Rhine valleys. The fact that the Danube is navigable from Germany to its mouth adds greatly to the value of these routes. But goods taken in either direction must pass through foreign ports. What disadvantage do you see in that fact?

The outlets by sea are still less convenient. Although Austria-Hungary is next in size to Russia among European nations, it has but little seacoast. Estimate its length. And, what is still worse, the coast is very difficult to reach from the interior on account of rugged mountains that rise from the very seashore. Largely for this reason the ocean commerce of the empire is much less than that of other large European countries. By far the greater part of the foreign trade is carried on through German ports. One can readily understand, therefore, why Austria-Hungary has comparatively little manufacturing, and no large colonies.

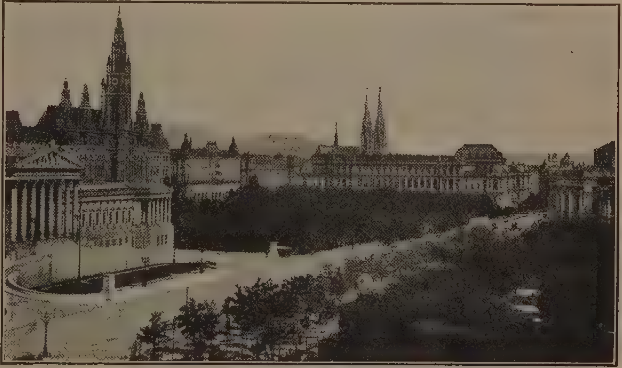


FIG. 448. — A view in Vienna showing some of the fine public buildings.

Principal cities

While there are many small cities in this empire, there are surprisingly few large ones. The two largest, VIENNA, the capital of Austria, and BUDAPEST, the capital of Hungary, are on the Danube River and not on the seacoast. The reasons for this have just been suggested. State them.

VIENNA, which is larger than Philadelphia, is the greatest city in Austria-Hun-

1. Vienna

gary and the fourth in size in Europe. The main reason for its size is the fact that it is the capital of a great empire, and is located on a large river in the central part of Europe. Moreover, it is situated at an opening between mountains, through which, from the earliest times, the best routes have passed from western Europe to Asia, and from northern Europe to the Mediterranean. The railways which lead from St. Petersburg to Rome, and from Berlin and Paris to Constantinople, converge toward this point, making the city a great railway and trade center.

Vienna is a beautiful city, with many fine public buildings (Fig. 448), including the palace of the emperor and some noted museums. The well-known University of Vienna is also located here. As in most large cities, there is much manufacturing of various kinds.

2. Budapest

BUDAPEST, consisting of two towns (Buda and Pest), on opposite banks of the Danube, is the seat of the Hungarian government and the home of the Emperor for a part of each year. The city lies on the edge of the fertile wheat-raising plains of the Danube, and, like Odessa on the Black Sea, is engaged in flour manufacture and grain shipment.

3. Prague

PRAGUE, the third city of Austria-Hungary, is situated on the navigable Elbe, which has been an important trade route since early times. Located in the midst of a rich mineral region, it is a noted manufacturing center.

4. Trieste and Fiume

TRIESTE is the largest Austrian seaport. Although separated from the main part of the country by mountain ranges, it is connected with the interior by a railway. The pass which this railway follows in crossing the mountains was the route of entrance to the Danube Valley, even as far back as the time of the Roman Empire. FIUME, southeast of Trieste, has an excellent harbor, but has little trade and is a small town.

Liechtenstein

On the boundary between Austria and Switzerland is *Liechtenstein*, a very small independent country united with Austria-Hungary by a customs treaty.

Review Questions

1. Describe the surface features of this empire. 2. The climate. 3. Tell about the mixture of races here. 4. Give reasons for such a mixture. 5. What is the nature of the government? 6. State the principal facts about lumbering and agriculture. 7. Mining. 8. The extent and kinds of manufacturing. 9. Give reasons why there is so little manufacturing. 10. Locate and give the principal facts about Vienna. 11. Budapest. 12. Prague. 13. Trieste and Fiume. 14. What and where is Liechtenstein?

Suggestions

1. What is the relative importance of the Danube and the Rhine rivers? 2. Find some Bohemian glass, to see how beautiful it is. 3. In an atlas look up Austria-Hungary to find the portions which are called Tyrol, Moravia, Bohemia, Bosnia, Herzegovina, and Transylvania. 4. Look up some facts about the history of Poland. 5. Find out something about the Triple Alliance. 6. Read about the influence of Emperor Francis Joseph in holding the different parts of the empire together. 7. Find out something about Kossuth.

XII. THE BALKAN PENINSULA (Fig. 416)

Map Study

1. What countries border Roumania (Fig. 416)? 2. Name the countries south of the Danube. 3. What does the relief map (Fig. 360) tell you about the surface of each? 4. What can you expect as to the temperature on this peninsula? Why? As to the rainfall? Why? 5. Compare the number of large cities with the number in Germany and Italy. What conclusions do you draw concerning the occupations of the people? 6. Compare the area of Turkey in Europe with that of your own state.

Boundaries and surface features

This double-pointed peninsula, called the Balkan Peninsula, is bounded on one side by the Adriatic and Mediterranean seas, on another by the Ægean and Black seas; but, unlike other European peninsulas, it has a very long land boundary. Trace this boundary.

Throughout almost its entire extent the surface of the Balkan Peninsula is mountainous, which offers an explanation of the large number of separate countries here. How? Many of the valleys are suited to agriculture, the most extensive being the plains of the Danube in Roumania and Bulgaria.

Climate

The climate varies greatly from seashore to interior, and from valley to mountain. Along the southern coast the winters are mild, as elsewhere near the Mediterranean. But in the northeast, near Russia, hot summers are followed by cold winters, when icy winds sweep down from the Russian steppes and the Danube freezes over.

In so mountainous a land there is also much variation in rainfall. On the western slopes — for example, near the shores of the Adriatic — there is an abundance of rain; but on the east coast and in the interior valleys, especially in Greece, there is so little rain that agriculture depends upon irrigation. Why is this true of Greece especially (p. 262)?

Closeness to Asia; effects on plants, animals, and people

The eastern branch of the Balkan Peninsula comes so close to Asia that it has been called a "bridge" between Europe and Asia. At two points, the Dardanelles and the Bosporus (Fig. 452), the continents are separated only by narrow straits. Animals and plants have crossed these barriers so easily, that there is a mixture of European and Asiatic species in that part of Europe.

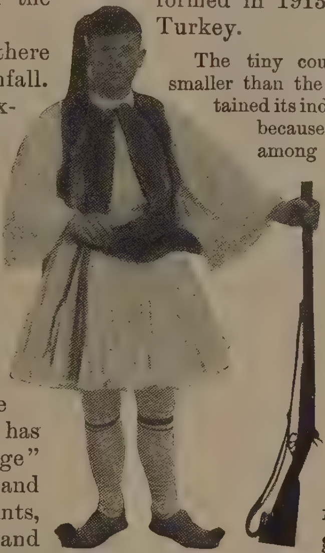


Fig. 449. — A Greek peasant in native costume.

This region has also been a bridge for the passage of many peoples. Romans, various tribes of Slavs, and finally the Mohammedan Turks from Asia, have brought the Balkan Peninsula under their rule. Wherever the Turks went, they brought ruin; and for four centuries, while the rest of Europe was advancing, they held this region in such control that almost all progress was checked. In the recent Balkan war, however, many of its people have thrown off the Turkish yoke, so that the peninsula is now divided among several nations, and Turkey in Europe is only a small part of what it was a hundred years ago.

Countries now occupying the peninsula

Aside from Turkey, the separate countries that have been formed are Albania, Montenegro, Servia, Roumania, Bulgaria, and Greece. Each of these is now entirely independent. Albania is a new state. It was formed in 1913 from territory taken from Turkey.

Montenegro

The tiny country of Montenegro, which is smaller than the state of Connecticut, has maintained its independence largely because of its situation among the mountains. The country is of slight importance; its soil is so poor that there is little agriculture; there is less manufacturing, and not a single railway. The principal occupation is cattle raising. Cettinje, the capital, has a population of less than five thousand.

Servia

1. Agriculture

Bordering on southern Hungary, Servia shares some of the advantages of that country. Since much of its surface is rugged and heavily forested, only a small portion is cultivated. Among the leading products are corn, wheat, and other grains, reminding us of Hungary. There is also much fruit, especially grapes and plums, which, when dried, are sold as raisins and prunes. Many cattle, sheep, and pigs are raised for export, the pigs being allowed to roam in the oak and beech forests. Why there?

2. Other industries and chief city

The industries of Servia are only partly developed. For example, although coal, iron, lead, silver, gold, and other metals are known to exist, there is very little mining; nor is there much manufacturing. It will require more time to recover from the centuries of Turkish misrule.

The capital of the kingdom is Belgrade, a city finely situated upon the Danube, and owing its importance partly to easy transportation on that river.

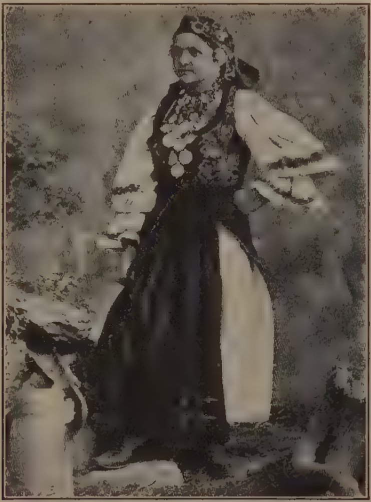


FIG. 450. — A Roumanian peasant in native costume.

Roumania and Bulgaria

1. Agriculture

These two countries have much in common, although the Danube separates them for a long distance. They together control its lower course, a fact of much importance to Austria-Hungary. Why?

Broad plains, suited to agriculture, border the Danube in both countries, though the plains are far more extensive in Roumania than in Bulgaria. Naturally, therefore, there is much farming. In both countries wheat and other grains are among the chief crops. The warmer climate of Bulgaria, south of the Balkan Mountains, permits the culture of products that cannot be raised in Roumania; for example, the mulberry for the silkworm, and roses for the valuable perfume, attar of roses.

Many sheep, as well as other live stock, are raised in each country; in fact, herding is almost the sole industry on the barren steppes of eastern Roumania.

There are large tracts of forest in each country; but there is more in Bulgaria, owing to its rugged surface, than in Roumania. Each country has valuable mineral deposits; but, as in Servia, there is little mining. Nor is there much manufacturing, except such hand work as the manufacture of Turkish rugs.

2. Other industries; also chief cities

With such slight development of the resources, there are few large cities. By far the largest is BUCHAREST, the capital of Roumania. Find the capital of Bulgaria.

Turkey in Europe

1. Character of the people, and of government

The Turks, who are Mohammedans, have ideas and customs that are very unlike those of other Europeans. They are unprogressive, and are unwilling to grant rights to the many Christians who live in Turkey. Their ruler, or *Sultan*, until recently has had absolute power, which he has often used very cruelly; and the government has been the worst in Europe.

2. Chief city

(1) Its location

CONSTANTINOPLE, the capital of the Ottoman Empire, as Turkey is often called, has been famous for many centuries. Being situated on the beautiful, river-like outlet of the Black Sea, called the Bosporus (Fig. 452), it commands the channel through which the commerce of the Black Sea must pass. This is a natural site for a city; for it is the point where the crossing can best be made from Europe to Asia.

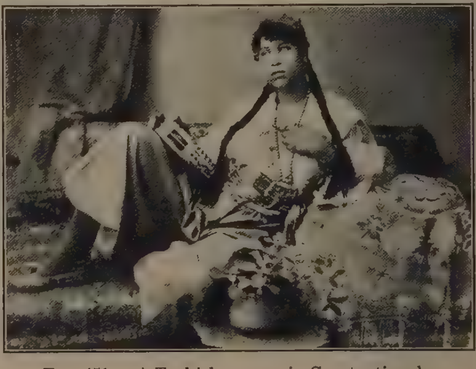


FIG. 451. — A Turkish woman in Constantinople.

The site of Constantinople is so favorable for a

(2) *Its history and present importance*

city that it was the seat of a Greek colony even before the days of Christ. Later the Roman Emperor Constantine named the city after himself (*Constantine* and *polis*, meaning city), and made it the capital of the Roman Empire. For centuries it was noted as one of the richest and most prosperous cities of Europe.

After being captured by the Turks, however, it lost much of its beauty; but some of the ancient splendor still remains (Fig. 452). There are palaces, mosques, and other interesting and costly buildings; but side by side with them are the dwellings of the common people, who live in the most squalid poverty. The houses, street scenes, people, and customs remind one of Asia rather than of Europe. How does it rank in size with other large European cities? With the large cities of the United States? (See table, Appendix, p. 426.)

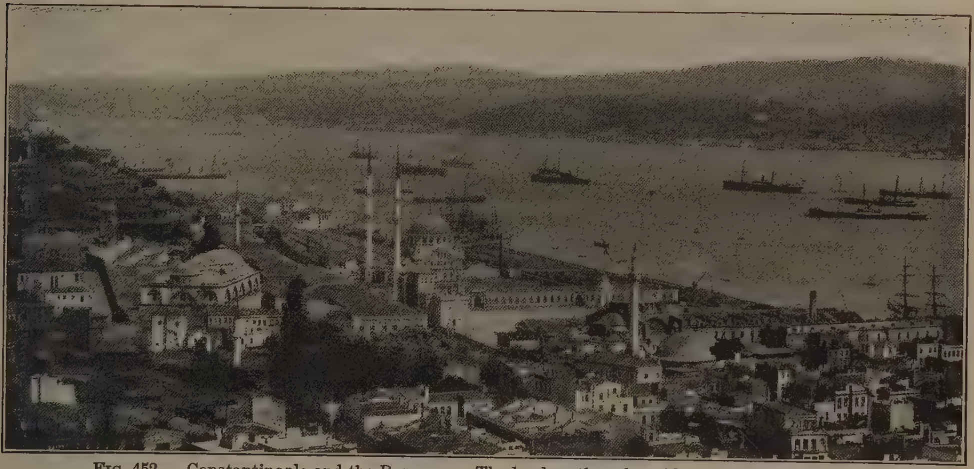


FIG. 452. — Constantinople and the Bosporus. The land on the other side of the strait is in Asia.

Dissatisfaction with the Turkish Government finally led (1912) to war. On the one side was Turkey and on the other four of the Balkan states — Bulgaria, Servia, Montenegro, and Greece. These states were called the Balkan Allies. In this war the allies were successful and took from Turkey most of her territory in Europe. Part of this territory was formed into a new state about the size of Vermont, called Albania. The rest of the territory was divided among the allies so that each state increased its size to a considerable extent.

In this division Greece came into possession again of the many islands that were formerly under her government. Servia, although failing to secure a seaport on the Adriatic, gained control over new territory almost equaling her former area. Bulgaria is now about as large as the state of Pennsylvania. It gained considerable territory lying along the Black Sea. Montenegro obtained some territory from Bulgaria but is still the smallest state on the Balkan Peninsula.

The settlement of the Balkan question promises improved conditions in the Balkan countries. The governments of the countries seem now to be firmly established, the industry and commerce are developing, and the people seem contented.

Albania

The new state of Albania extends from the boundary of Greece to the boundary of Montenegro and lies close along the Adriatic Sea. It has a pleasant climate with plenty of rainfall. The soil is fertile and suited to agriculture. Cereals, fruits, and tobacco are the principal products. Cattle and sheep are raised. The principal town is SKUTARI.

The southern end of the Balkan Peninsula

Greece

1. Surface and climate

is occupied by Greece. Owing to many short mountain ranges, extending in different directions, the surface of Greece is quite rugged, and large sections are unfit for farming. Yet there are many small, fertile valleys. The coast line is very irregular, with numerous peninsulas, islands, deep bays, and fine harbors, formed by the sinking of the irregular land.

The Mediterranean causes a warm, pleasant climate, as in southern Italy. In Greece, however, as in Italy, the rainfall, which is moderate in winter, is so light in summer that irrigation is necessary for agriculture.

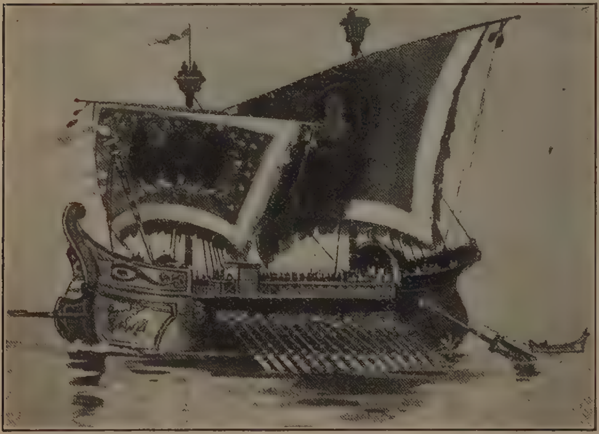


Fig. 453. — A Greek ship, used 700 years before Christ. Besides sails, long oars were used for driving the boat through the water.

2. Advantages that the ancient Greeks enjoyed

It was in this small peninsula that the marvelous civilization of ancient *Hellas*, or Greece, was developed. While the conditions amid which the Greeks lived may not seem to have been very favorable, they were far better than they at first appear. The sea and mountains protected them from foreign enemies; and at the same time the sea, by means of the many fine harbors and protected inlets, so connected the people that it was easy for them to carry on peaceful commerce.

In other parts of the world strong nations have developed under such conditions as these. It was true, for instance, in Scandinavia, in the British Isles, and in the Spanish and Italian peninsulas. It is also true in the Japanese Islands, the home of the most highly developed Asiatics.

3. Early history of Greece

Because of their ability to navigate the inland seas, the Greeks, in very early times (Fig. 453), kept closely in touch with the people from whom they had separated, and who still dwelt opposite them, on the coast of Asia. They improved upon the arts and customs of their mother country, and in time became the greatest power in the then known world. In those ancient days they developed a civilization which, in spite of all our progress, still excels our own in very important respects.

They cruised about the shores of the Mediterranean and became explorers at a time when most of Europe was occupied by savages or barbarians. They entered into trade relations with their neighbors, taught them Greek arts, and established many colonies. Among these were some colonies in Italy, through which the Greeks exerted a strong influence upon the Romans.

4. Its later history

Rome finally conquered Greece, and became the leading country of the world, spreading her civilization far over Europe. It must be remembered, though, that much of this civilization was really derived from the Greeks. After the decline of the Roman Empire, other people from the north invaded Greece; and finally the Turks entered the country and carried ruin to this, as to other parts of the Balkan Peninsula. Greece is now independent, and is a limited monarchy.

5. Principal industries

In this little country there are few natural resources. There is no coal, and therefore little manufacturing. There is some mining, as of iron ore, lead, and zinc; but the principal occupations are herding and farming. Large numbers of sheep and goats are raised; and the chief farm products are grain, tobacco, olives, and fruits. Among the latter is the small variety of grape known as the currant. Currants, together with raisin grapes, are cultivated in large quantities on the steep hillsides; after being gathered they are spread out to dry, and are marketed as dried fruit.

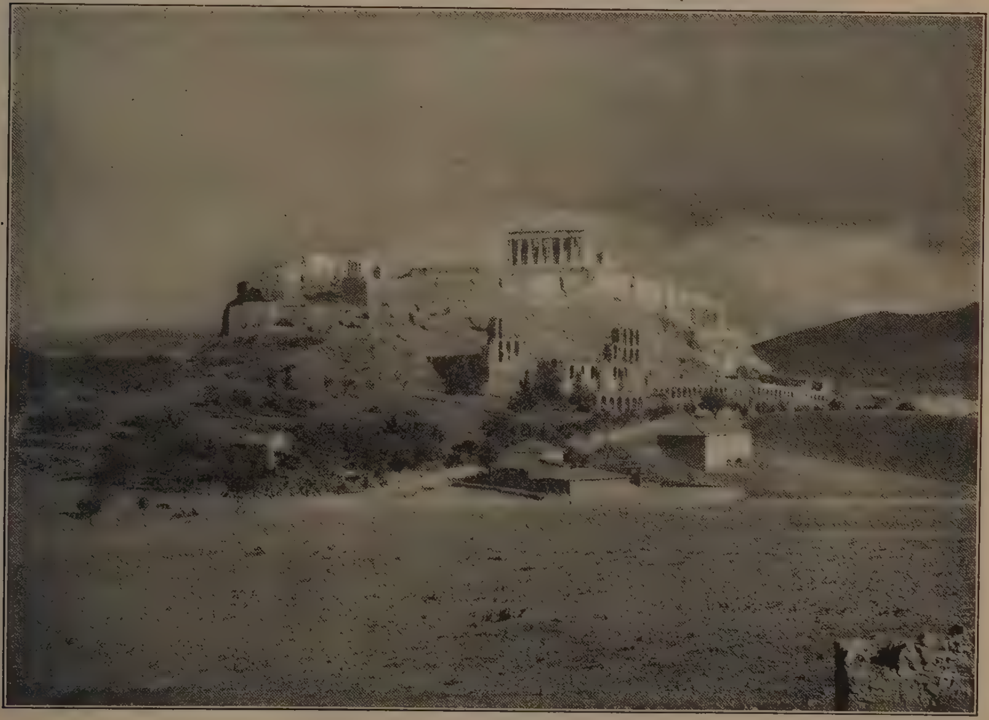


Fig. 454. — The Acropolis at Athens.

The neighborhood of the sea has led the Greeks to continue their seafaring life, and they still carry on an extensive foreign trade. Many are also engaged in fishing, and in securing bath sponges from the shallow sea bottom among the Greek islands.

6. Leading city

Athens, the capital and most important city, with about a hundred and sixty-seven thousand inhabitants, is situated inland six miles from its port, Piræus. The principal streets of the present city are quite modern; but ruins of ancient Athens are still numerous. The most noted buildings, and some of the finest temples of ancient Greece, stood upon the Acropolis (Fig. 454), a level-topped rocky hill with steep sides. This stronghold was the natural center of settlements on the surrounding plain.

The many islands in the neighborhood of Greece are either mountain crests or volcanic cones. Now and then we hear of an earthquake shock in this

Islands near Greece

island region, or archipelago, showing that the mountains are still growing. The largest island near Greece is *Crete* (Fig. 358), which, like the smaller islands, is inhabited mainly by Greeks. It is now controlled by the Greeks. The inhabitants are engaged in industries similar to those of Greece.

Review Questions

1. Describe the boundaries and surface of the Balkan Peninsula. 2. The climate. 3. How close is this peninsula to Asia, and what have been some of the effects of this location on plants, animals, and people? 4. What countries now occupy this peninsula? Locate each. 5. Tell what you can about Montenegro. 6. About agriculture in Servia. 7. What are the other industries? 8. Name and locate the chief city. 9. What are the agricultural products of Roumania and Bulgaria? 10. What are the other industries? 11. The chief cities? 12. What can you tell about the character of the people and government of Turkey in Europe? 13. What are the industries? 14. Why is the location of its chief city so favorable? 15. State the history and present importance of this city. 16. Why have the Balkan Allies driven the Turks out of Europe? 17. Describe the surface and climate of Greece. 18. Show what advantages the ancient Greeks enjoyed. 19. Give facts in the early history of Greece. 20. In its later history. 21. What are the principal industries? 22. Tell about the leading city. 23. What about the islands near Greece?

Suggestions

1. What reasons can you suggest for the fact that these eastern countries are in a constant state of unrest? 2. Turkey is sometimes referred to as the "sick man of Europe." Why? 3. How was Greece well situated for the trade of the ancient world? 4. Learn some facts about Homer, Plato, and other noted Greeks. 5. Read about the defense of the Pass of Thermopylæ. 6. What reasons can you suggest for the fact that ancient Greece was divided into several independent states, not unlike our own, but lacking a federal union? 7. Name the principal cities in the Balkan Peninsula, and locate each.

General review questions and comparisons with North America

1. Compare the climate of western Europe with that of the west coast of North America (p. 211). 2. Make the same comparison for the eastern parts of the two continents. 3. What European countries were covered, either wholly or in part, by an ice sheet in the Glacial Period (Fig. 363)? 4. Does Europe or North America have the advantage in regard to irregular coast line? How is it an advantage? 5. Name and locate the principal mountain ranges in each continent. Which continent has the advantage as to the direction of the ranges? Why (p. 261)? 6. Name and locate the principal rivers in each continent. Which are the largest in each case? 7. Draw an outline map of Europe, inserting the boundaries and names of the countries. 8. How do our larger Western States compare in area with France and Germany? In population? 9. Which are the two or three most progressive countries of Europe? Give reasons. 10. What is the prevailing kind of government in Europe? In North America? 11. Which European country has the best location for world commerce? Why? 12. Which is best situated for continental commerce? Why (p. 308)? 13. Which country of North America has the most favorable position for trade? How? 14. Compare in population the five largest European cities with the five largest in North America (Appendix, p. 426). 15. State the main advantages of the position of each of these ten cities. 16. Name and locate the five largest seaports of Europe (Fig. 358). 17. How do they compare in population with New York, Philadelphia, Boston, Baltimore, and San Francisco? 18. Name and locate the five largest interior cities, and compare their population with that of Chicago, St. Louis, Cleveland, Buffalo, and Cincinnati. 19. What cities of Europe and North America are near the 46th parallel of latitude? The 50th? The 60th? 20. Name some agricultural products common to both Europe and the United States. 21. Name others that are found in the United States, but not in Europe. Why this difference? 22. Name the chief wheat-producing countries of Europe. 23. In what countries of Europe is raw silk produced? Why do we not raise silkworms (p. 286)? 24. In what countries are sugar beets extensively produced? 25. In what countries is most lumber obtained? 26. Make a list of the European countries which have extensive coal deposits. 27. Which countries have little or none? What is the effect on the industries in each case? 28. Which countries have little or no mining? 29. Which countries have important manufacturing industries? Which have very little manufacturing? Give reasons for this difference. 30. With which group would the United States be classed with regard to mining and manufacturing? 31. Which of the European nations have you seen represented on our streets? 32. Write a paper stating some of the advantages that we enjoy over European countries. 33. State some of the advantages that they enjoy over us. 34. Which one of the European countries would you prefer to visit? Why?

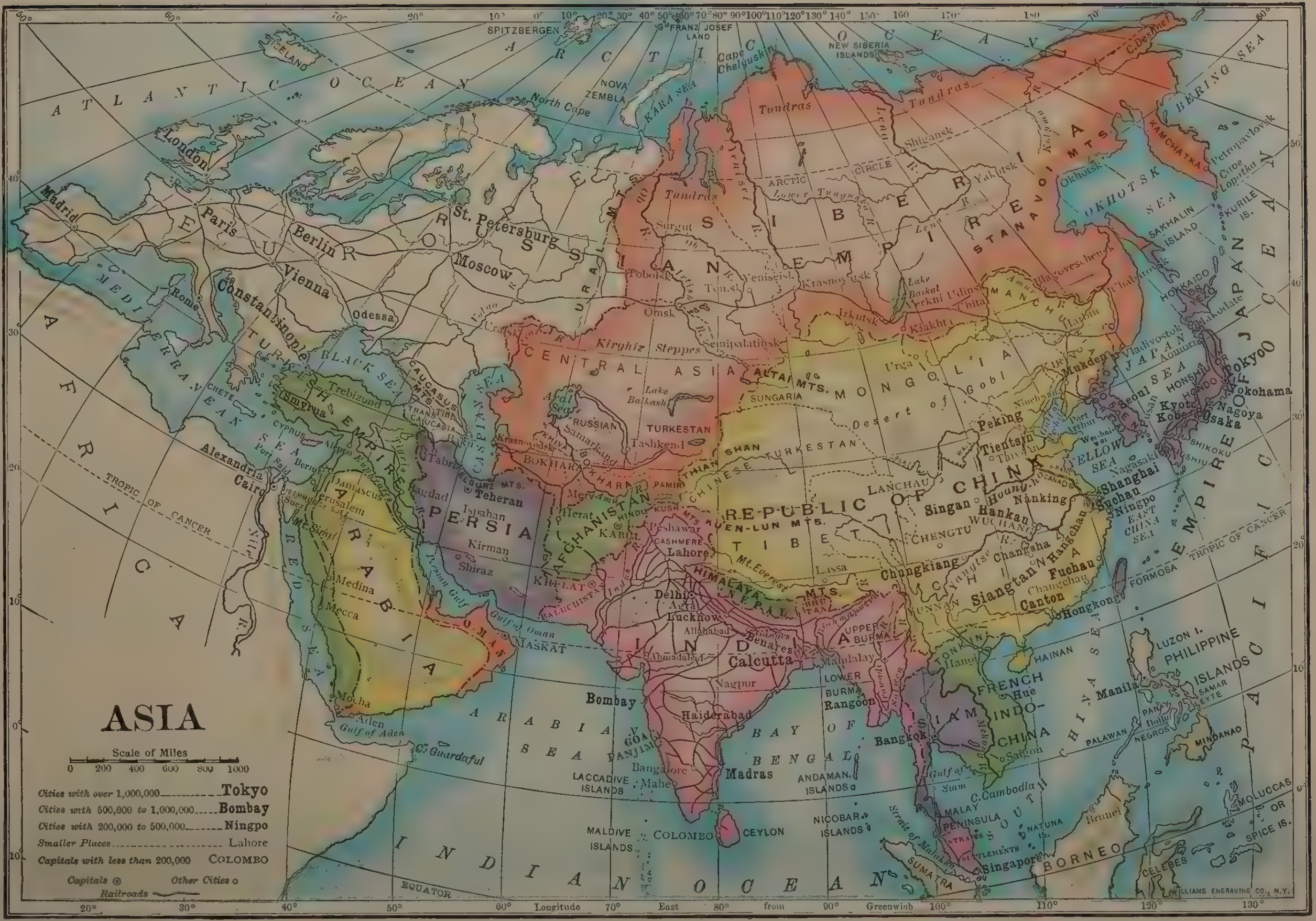

ASIA
Scale of Miles
0 200 400 600 800 1000
Cities with over 1,000,000 Tokyo
Cities with 500,000 to 1,000,000 Bombay
Cities with 200,000 to 500,000 Ningpo
Smaller Places Lahore
Capitals with less than 200,000 COLOMBO
Capitals ◎ Other Cities ○
Railroads
Longitude East from Greenwich
EQUATOR
TROPIC OF CANCER
ARCTIC CIRCLE
ATLANTIC OCEAN
ARCTIC OCEAN
PACIFIC OCEAN
INDIAN OCEAN
AFRICA
EUROPE
RUSSIAN EMPIRE
SIBERIA
CENTRAL ASIA
MONGOLIA
MANCHURIA
REPUBLIC OF CHINA
CHINESE TURKESTAN
TIBET
PERSIA
AFGHANISTAN
BALUCHISTAN
INDIA
ARABIA
TURKISH EMPIRE
SIAM
FRENCH INDO-CHINA
JAPAN EMPIRE
PHILIPPINE ISLANDS
BORNEO
SUMATRA
CELEBES
MOLUCCAS OR SPICE IS.
MEDITERRANEAN SEA
BLACK SEA
CASPIAN SEA
RED SEA
ARABIAN SEA
BAY OF BENGAL
SOUTH CHINA SEA
EAST CHINA SEA
YELLOW SEA
JAPAN SEA
OKHOTSK SEA
BERING SEA
KARA SEA
London
Paris
Madrid
Rome
Berlin
Vienna
Constantinople
St. Petersburg
Moscow
Odessa
Alexandria
Cairo
Teheran
Bombay
Calcutta
Madras
Delhi
Lahore
Peking
Tientsin
Shanghai
Hankau
Canton
Tokyo
Yokohama
Osaka
Kyoto
Kobe
Nagoya
Manila
Singapore
Bangkok
Rangoon
Hongkong
ALTAI MTS.
URAL MTS.
HIMALAYA MTS.
KUEN-LUN MTS.
THIAN SHAN
STANAVOI MTS.
CAUCASUS MTS.
Mt. Everest
Desert of Gobi
Kirghiz Steppes
WILLIAMS ENGRAVING CO., N.Y.

FIG. 455.

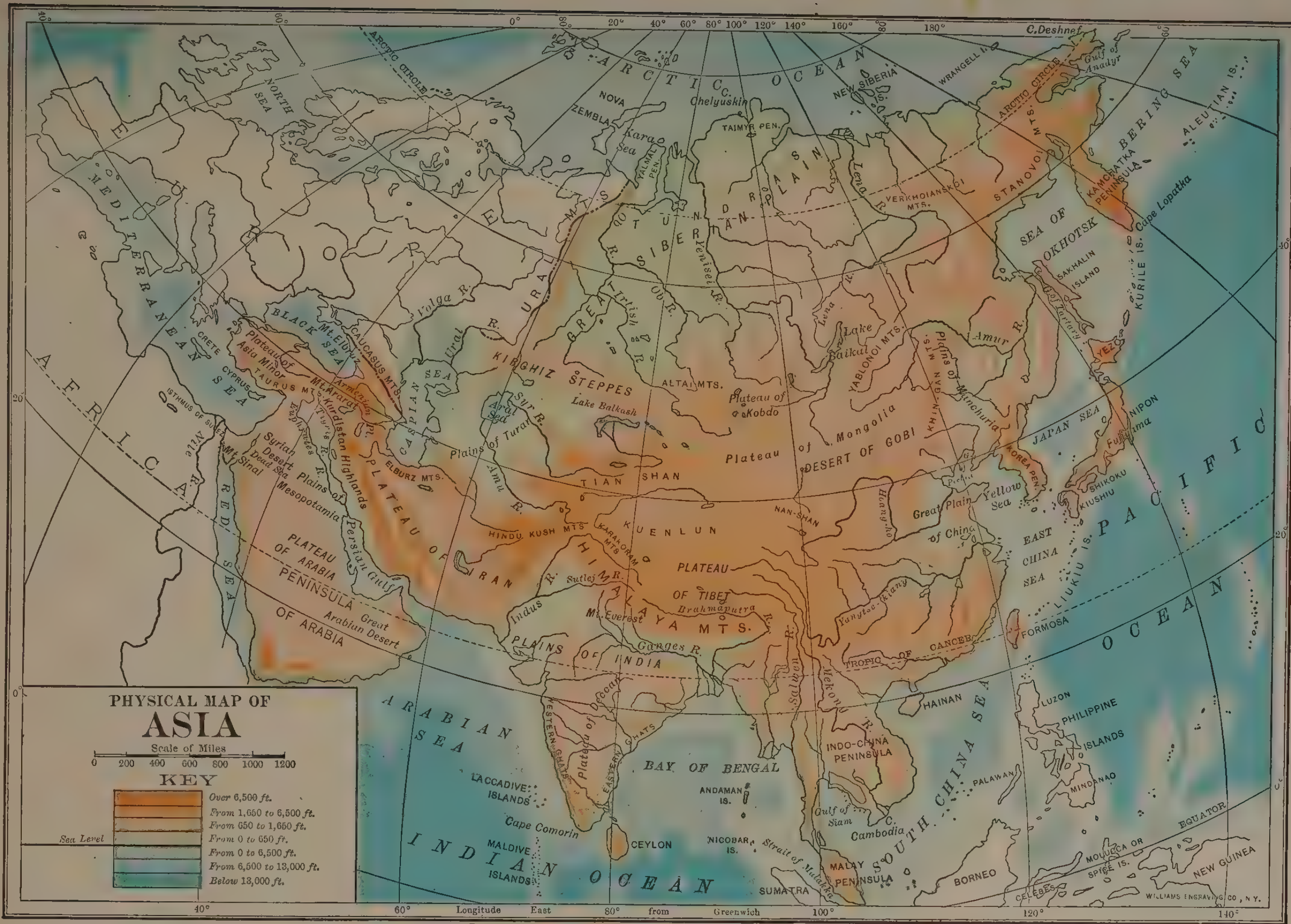

PHYSICAL MAP OF
ASIA
Scale of Miles
0 200 400 600 800 1000 1200
KEY
Over 6,500 ft.
From 1,650 to 6,500 ft.
From 650 to 1,650 ft.
From 0 to 650 ft.
Sea Level
From 0 to 6,500 ft.
From 6,500 to 13,000 ft.
Below 13,000 ft.
ARCTIC OCEAN
ARCTIC CIRCLE
C. Deshnef
Gulf of Anadyr
BERING SEA
ALEUTIAN IS.
WRANGELL I.
NEW SIBERIA IS.
C. Chelyuskin
TAIMYR PEN.
NOVA ZEMBLA
Kara Sea
YALMAL PEN.
NORTH SEA
EUROPE
MEDITERRANEAN SEA
CRETE
CYPRUS
ISTHMUS OF SUEZ
Nile R.
AFRICA
RED SEA
Mt. Sinai
Dead Sea
Syrian Desert
PLATEAU OF ARABIA
PENINSULA OF ARABIA
Great Arabian Desert
Persian Gulf
Plains of Mesopotamia
Euphrates R.
Tigris R.
Kurdistan Highlands
Plateau of Asia Minor
TAURUS MTS.
Mt. Ararat
Armenian Pl.
BLACK SEA
Mt. Elbruz
CAUCASUS MTS.
CASPIAN SEA
ELBURZ MTS.
PLATEAU OF IRAN
Volga R.
Ural R.
URAL MTS.
KIRGHIZ STEPPES
Aral Sea
Sur R.
Plains of Turan
Amu R.
Lake Balkash
HINDU KUSH MTS.
KARAKORAM MTS.
Indus R.
Sutlej R.
HIMALAYA MTS.
Mt. Everest
Ganges R.
PLAINS OF INDIA
Plateau of Deccan
WESTERN GHATS
EASTERN GHATS
ARABIAN SEA
LACCADIVE ISLANDS
Cape Comorin
MALDIVE ISLANDS
CEYLON
INDIAN OCEAN
BAY OF BENGAL
ANDAMAN IS.
NICOBAR IS.
Strait of Malakka
SUMATRA
MALAY PENINSULA
Gulf of Siam
C. Cambodia
INDO-CHINA PENINSULA
Salwen R.
Mekong R.
Brahmaputra R.
PLATEAU OF TIBET
KUENLUN
NAN-SHAN
TIAN SHAN
ALTAI MTS.
Plateau of Kobdo
Plateau of Mongolia
DESERT OF GOBI
GREAT SIBERIAN PLAIN
TUNDRA
Ob R.
Irtish R.
Yenisei R.
Lena R.
Lake Baikal
YABLONOI MTS.
KHIN GAN MTS.
Plains of Manchuria
Amur R.
VERKHOIANSKOI MTS.
STANOVOI MTS.
SEA OF OKHOTSK
KAMCHATKA PENINSULA
Cape Lopatka
KURILE IS.
SAKHALIN ISLAND
G. of Tartary
YEZO
NIPON
Fujiyama
JAPAN SEA
KOREA PEN.
SHIKOKU
KIUSHIU
Yellow Sea
Great Plain of China
Hoang-ho
Yangtse-kiang
TROPIC OF CANCER
EAST CHINA SEA
LIUKIU IS.
FORMOSA
PACIFIC OCEAN
HAINAN
SOUTH CHINA SEA
LUZON
PHILIPPINE ISLANDS
PALAWAN
MINDANAO
BORNEO
CELEBES
MOLUCCA OR SPICE IS.
NEW GUINEA
EQUATOR
Longitude East from Greenwich
40° 60° 80° 100° 120° 140° 160° 180°
WILLIAMS ENGRAVING CO., N.Y.

FIG. 456.

PART V. ASIA, AFRICA, AUSTRALIA, AND ISLAND GROUPS

I. ASIA

Map Study

1. Compare the greatest length and breadth of Asia with that of North America (Fig. 9). 2. Compare its area with that of other continents. (For Areas, see Appendix, p. 424.) 3. Where are the mountains? 4. The plains? 5. Draw an outline map of Asia, adding the names and boundaries of the countries. 6. Find three large inland seas and lakes. Which have no outlets? 7. Find the area of China, India, Siberia. Compare each with the United States in area. 8. What facts concerning the climate do you discover from the map? 9. What does the general absence of railways tell about the development of the people? In what parts have there probably been most progress? 10. Name some of the large islands near Asia. Name some of the largest islands between Asia and Australia (Fig. 517).

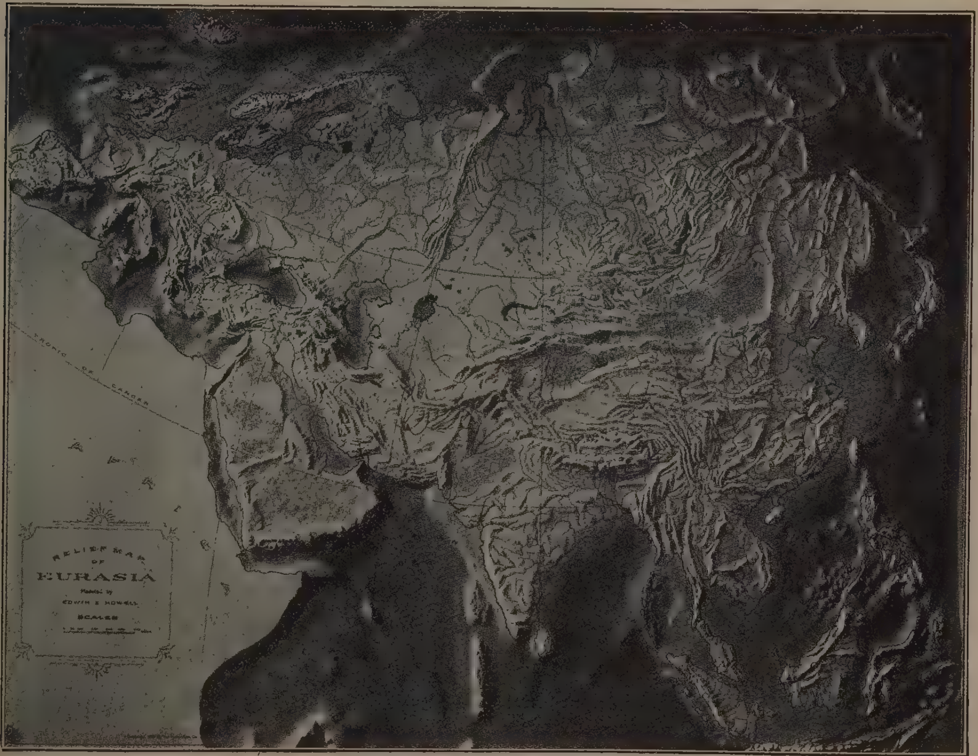


FIG. 457. — Relief map of Eurasia.

1. General Facts

Size and position

Asia, the largest of the continents, includes almost one third of the land of the globe. Its immense area is shown by the fact that it reaches from near the equator to a point halfway between the Arctic Circle and the north pole. How many degrees of latitude is that? How many miles? In what zones, therefore, does Asia lie? Is the same true of any other continent?

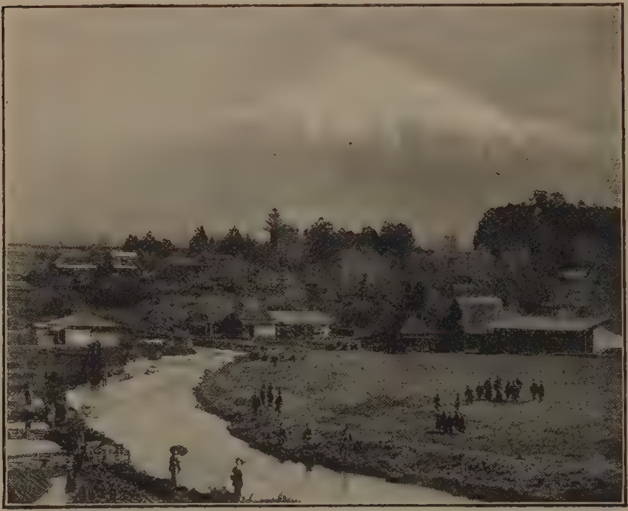


FIG. 458.—Fujiyama, a very perfect volcanic cone in Japan.

Find the Isthmus of Suez, which connects Asia with Africa. At one point Asia reaches within fifty miles of North America. Find that place. What is the name of the strait separating these two continents (Fig. 2)? The distance from the Suez Canal to Bering Strait is six thousand miles. There are so many degrees of longitude included in this distance, that, according to our plan for standard time, one would need to change his watch ten different times in traveling over it. How many changes are necessary in crossing the United States (Fig. 290)?

Surface features

1. Direction and character of the mountains

Asia resembles Europe in the irregular arrangement of its mountains (Fig. 457). While many of them extend east and west, there are others running nearly north and south. Point out examples of each.

The growth of the mountains and plateaus has caused many islands and peninsulas, with gulfs and seas between. The mountains in many parts of Asia are still slowly rising; and as the rocks move and break, earthquake shocks are common. There are also many volcanoes (Fig. 458); in fact, the islands east and southeast of Asia form the most active volcanic and earthquake region in the world.

2. Principal lowlands and highlands

Northern and western Asia form a vast plain, and there are other smaller plains and low plateaus; but a large part of the continent consists of mountains and high plateaus. Indeed, more than one twelfth of Asia, mainly in the central part of the continent, has an elevation above ten thousand feet.

Here are found the Himalayas (meaning abode of snow), whose loftiest peak, Mount Everest (29,000 feet), is the highest in the world. Locate it. Here, too, are other ranges with peaks rising above valleys whose bottoms lie eleven thousand feet above sea level, or higher than most mountains. Between the mountains are tablelands, like that of Tibet, which has an elevation of from ten thousand to fifteen thousand feet, some portions being as high as the loftiest peaks of the Alps.

3. The rivers

The mountains and high plateaus of central Asia are the source of many large rivers. Why? Note how many rise on the margin of this central highland and flow east, south, and north, to the sea. Name and trace each of the large rivers (Fig. 456). Through what countries do they flow? Which of these rivers are probably least useful? Why?

Climate

In so vast a land, with such differences in elevation, there are many different climates. Tropical heat is found in southern Asia, and here dense forests grow in the belt of calms (Fig. 475), and in those places where ocean winds blow over the land. Where winds do not blow from the ocean, however, the climate is very dry and there are broad deserts (Fig. 459.) Most of western Asia is arid for this reason. Much of central Asia is also arid, since the lofty mountains surrounding the central plateau cause most of the vapor to condense on their seaward slopes.

A large part of Asia has a temperate, and some of it even a frigid, climate, as in North America and Europe. For example, the climate at Peking resembles that of the northeastern part of the United States; and the climate of the plains of central Siberia resembles that of the plains of Minnesota and Dakota.

Such a climate, with warm summers and very cold winters, is called *continental;* and since Asia is the largest continent, the continental climate is best developed here. Thus where the Arctic Circle crosses the Lena River, the average temperature in July is 60° and in January 60° below zero, a difference of 120° between summer and winter. This is the lowest winter temperature known in the world, and this point is therefore sometimes called the *cold pole* of the earth.

Plants and animals

1. How those of northern Asia resemble those of Europe

Since northern Asia is really a continuation of Europe, the wild plants and animals, as well as the farm products, resemble those of Europe.

The cold northern part of Siberia, like northern Europe and America, is a vast expanse of frozen ground, or *tundra.* Toward the south the tundra grades into the *forest;* low stunted trees appear first, followed by true forests of evergreens, birches, poplars, etc. Farther south where the rainfall is light and where, in the warmer climate, evaporation is more rapid, the soil is too dry in summer for forests. This is the region of the *steppes,* which are covered with luxuriant grass in the north, but which grade into the barren desert farther south.

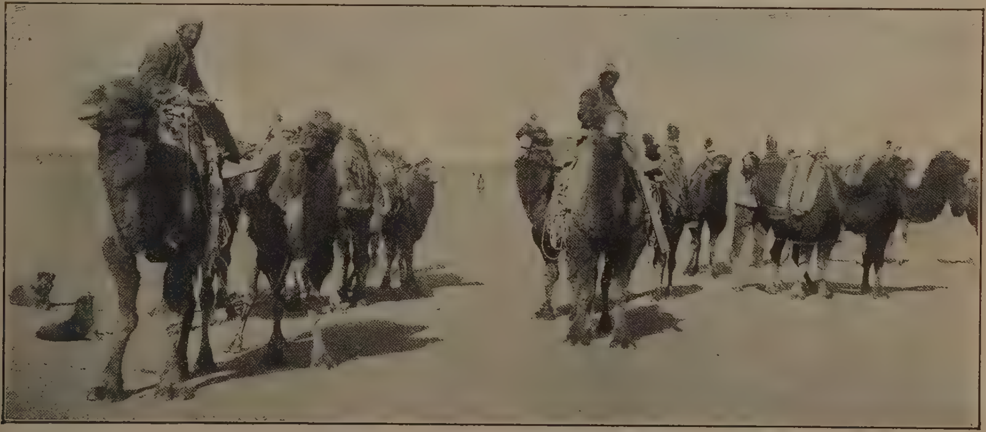
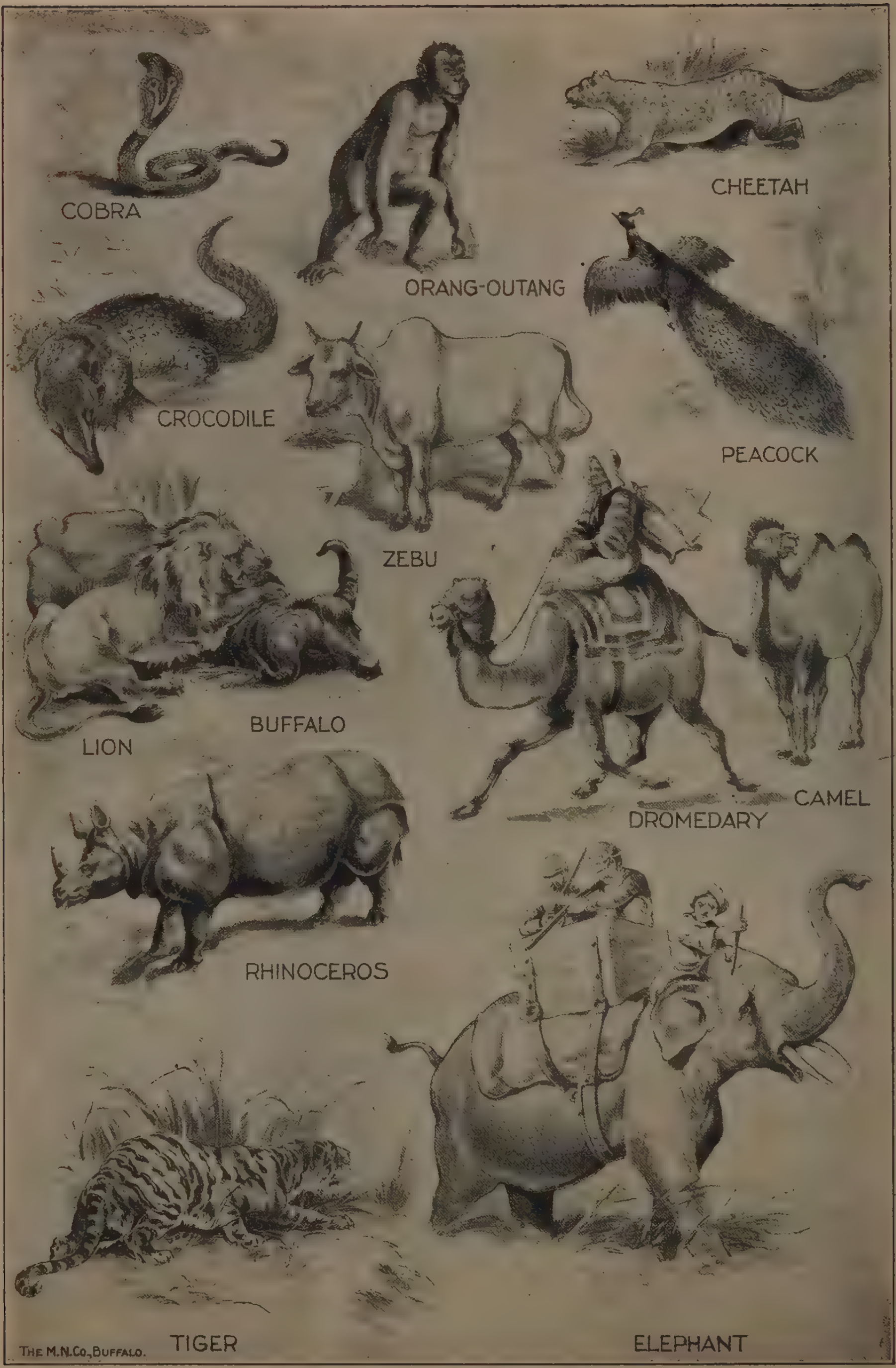


FIG. 459. — A caravan on the desert of Persia.

2. How and why those of southern Asia resemble those of Africa

In southern Asia, on the other hand, from Arabia to China, the plants and animals resemble those of Africa rather than of Europe and northern Asia. One reason for this is that southern Asia has a tropical climate, like Africa; another is that a mountain and desert barrier separates northern from southern Asia. Trace this barrier on Figure 457.


COBRA
ORANG-OUTANG
CHEETAH
CROCODILE
PEACOCK
ZEBU
LION
BUFFALO
CAMEL
DROMEDARY
RHINOCEROS
TIGER
ELEPHANT
THE M.N.Co., BUFFALO.

As in Africa, this arid portion, which includes Arabia, Persia, and central Asia, is the home of the camel (Fig. 460), while the elephant and rhinoceros (Fig. 460) live on the savannas and in the tropical jungles. Southern Asia is also the home of the fierce tiger and numerous species of monkeys and apes (Fig. 460).

3. Our debt to Asia for domesticated plants and animals

It was in Asia, probably the seat of the oldest civilization of mankind, that men first learned to make use of some of the animals and plants that are now so valuable. No one knows who it was that first tamed the wild animals, such as the horse, dog, and sheep, which now are used all over the world. Nor is it known who first cultivated the wheat and many other useful plants; but it is certain that the people of Asia knew their value long before Europeans became civilized. Centuries before the time of Christ the people of India grew cotton and wove it into cloth; and they kept sheep, horses, cattle, and goats. Tea and oranges were introduced into Europe from China, and the lemon tree came from India.

4. Examples of domesticated animals in Asia

The extent to which the Asiatic people have learned to make use of animals is shown by the following facts: On the frozen tundras where no large domesticated animals thrive, the *reindeer* not only supplies milk, meat, and hides, but is also used as a work animal. The *camel*, whose original home seems to have been Asia, makes it possible for man to live even in the desert (Figs. 459 and 489). *Elephants* are domesticated and made to work in the dense tropical forests (Figs. 461 and 480); and the *buffalo* is used as a work animal in hot, damp lands where horses find the climate trying (Fig. 481). Among the lofty plateaus and mountains, where the air is so rare, and the slopes so steep, that other work animals cannot be used, the *yak* is domesticated. Upon the steppes, where herds of *cattle*, *sheep*, and *goats* are kept, the *horse* is so necessary to the herder that the men almost live in the saddle. Indeed, the word *Cossack*, applied to Russians who dwell on the steppes, means horseman. The Asiatic people also have swine, poultry, dogs, cats, and other domestic animals.

People

1. Their number, and their location

More than half the human race, or over eight hundred and fifty million persons, live in Asia. But in spite of this vast number, most of the continent is sparsely settled. The mountain slopes, the cold plateaus, the steppes, deserts, forests, and tundras support but few inhabitants (Fig. 462). Nearly seven eighths of the Asiatic people dwell near the coast, especially on the river flood plains and deltas of the south and east. Almost every foot of land there is cultivated, and soil for gardens is even carried to boats on the rivers.

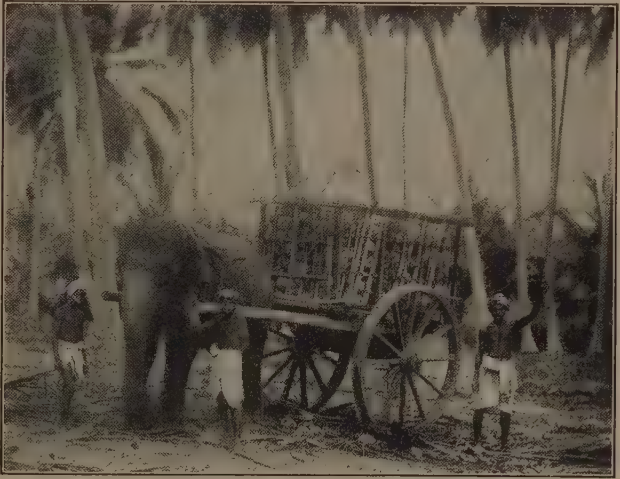


FIG. 461. — The elephant drawing a load of cocoanuts in Ceylon.

2. The races to which they belong, and their religion

Three fourths of the Asiatic people belong to the Yellow division of the human race (p. 232), while the remaining fourth are chiefly whites.

There are great differences in religion between these people and Europeans. Although the Christian religion started in southwestern Asia, and spread freely along the Mediterranean, it made little headway across the desert and mountain lands to the east. One difficulty was that there were still older, well-established religions in southern and eastern Asia. At present two thirds of the Asiatic people are either Brahmans or Buddhists (p. 233), as their ancestors have been for many centuries. Many others are of the Mohammedan faith, which had its start in Asia, long after Christ (p. 234). This religion has not only taken the place of the Jewish and Christian religions in most of western Asia, where they started, but has spread far to the eastward. Some of the natives even of the Philippine Islands are Mohammedans.

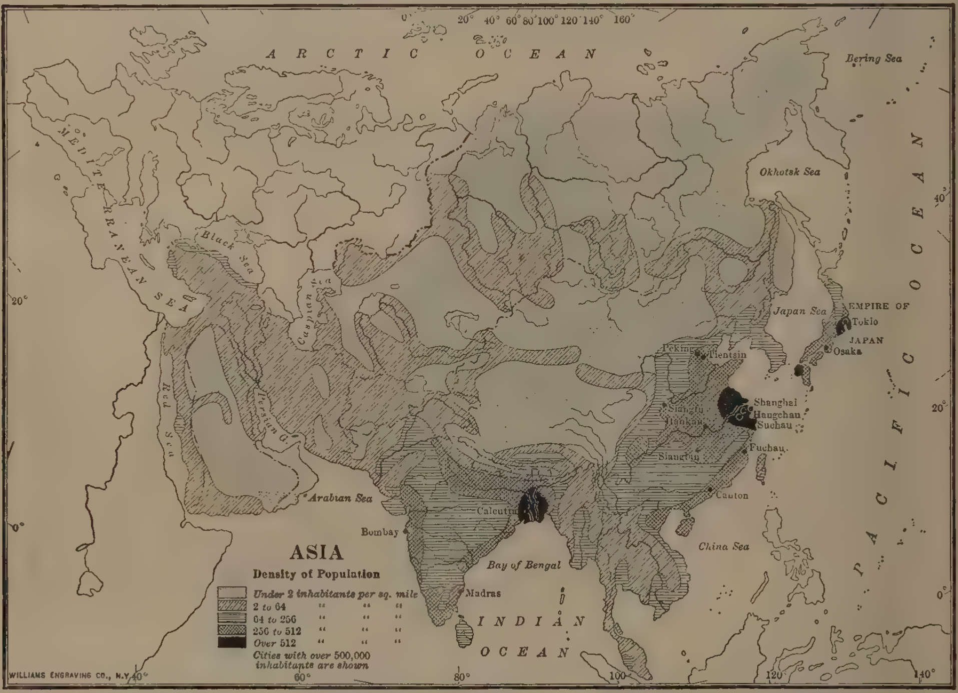


FIG. 462.

3. Reasons for their early progress

One reason why the people of Asia made such early progress toward civilization is the favorable situation of certain parts of the continent. For example, the flood plains of the Euphrates River, and of the Indian and Chinese rivers, had a fertile soil and an abundance of water for irrigation. Moreover, these fertile spots were protected from invasion by ocean, desert, and mountain barriers, so that the inhabitants were able to cultivate the arts of peace. Other centers, protected from the attacks of wandering hordes, are found among the shut-in valleys of the lofty mountains; and here, also, it was possible for people to advance in civilization.

Another reason for their progress is the fact that they have always had great ability. That this is true is indicated by the rapid advance that has been made in Japan and India in recent years.

4. Why they have fallen so far behind

In spite of their early progress and their great ability, the Asiatic people have long stood still, or have been falling behind, while Europeans were making rapid advances in civilization.

There are two reasons for this that are specially important. One is the fact that the Asiatic people have been so cut off from the rest of the world that they have been unable to learn from others. While Europeans were exploring the world in all directions, and while they were founding colonies and carrying on profitable commerce with foreigners, the people of Asia did little or nothing in these directions.

A second reason is that they have not *wanted* to learn from other people. Many Asiatics, like the Chinese, for example, have felt that their civilization was the best, and have therefore even *refused* to learn from others. No wonder that, under these conditions, the Asiatics have stood still, while Europeans have made rapid advance.

However, these people can improve rapidly, if they will.

5. Signs of future progress

And there are many signs that they are now determined to do it. The Japanese and the people of India have already made great progress, and the Chinese are beginning to do so. It seems probable that the people of Asia, in general, will rapidly approach the same level of civilization that the Europeans have reached.

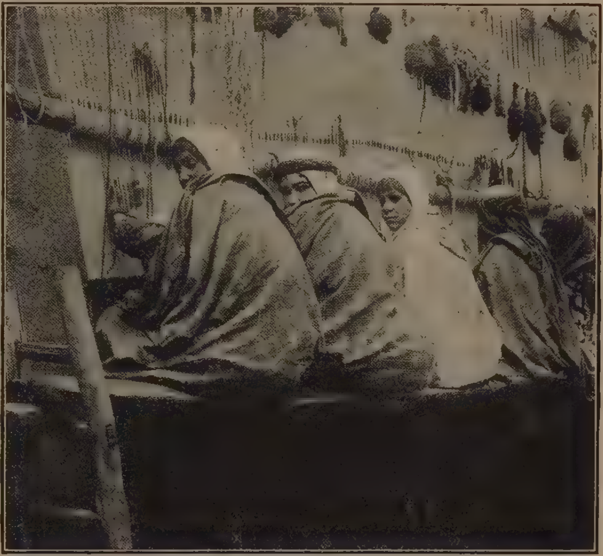


Fig. 463.—Persian women making a rug by hand. These people are so backward that they have not learned to use modern machinery; but their hand work is very artistic and beautiful.

2. The Turkish, or Ottoman, Empire

Although Constantinople, the capital of the Turkish Empire, is in Europe, Turkey controls more than ten times as much land in Asia as in Europe.

Why of special interest

Turkey in Asia, although now of little importance among nations, is of peculiar interest to us. It is within this country that many of the places mentioned in the Bible are located (Fig. 465); and here Christ was born, as well as the prophet Mohammed. It was from this center, also, that much of the ancient civilization spread along the shores of the Mediterranean.

Surface and climate

A large part of Turkey in Asia is tableland, crossed by short mountain ranges. There are also a number of extinct volcanoes, such as Mount Ararat.

There is little rainfall except along the coast of the Mediterranean and Black seas. The country is, therefore, mainly arid or desert; the streams are usually short and shallow; and there are numerous salt lakes. Point out the two principal rivers (Fig. 455).

How its position has been a disadvantage

Thus the climate is very unfavorable; but the location of the region is also unfavorable, and in part explains its lack of development. Asia Minor, the peninsula between the Mediterranean and Black seas, was the pathway for the ancient caravan trade between Europe and Asia. While this brought much commerce, it also led to many invasions, and the region has had a very unfortunate history.

More than five centuries before Christ the country was conquered by the Persians; two centuries later it came under the control of the Greeks; and later still, it became a part of the Roman Empire. With the decline of the Roman Empire came invasions by wandering Turks, Tartars, and others. It was over this highway that the Mohammedan Turks entered southwestern Europe, carrying destruction wherever they went.

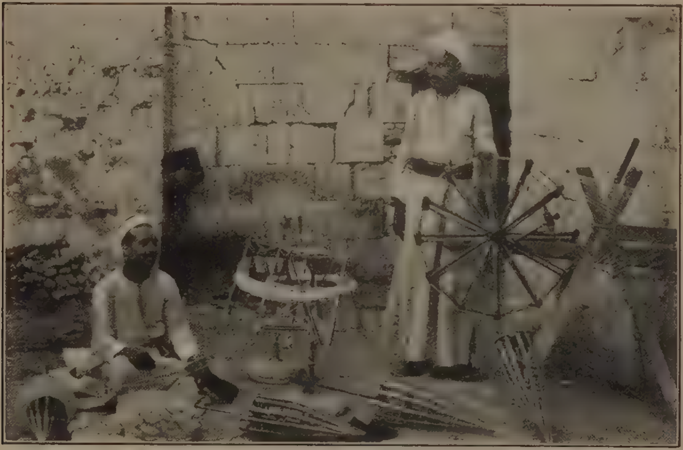


Fig. 464. — Native spinning wheels in Palestine, using the same methods as in the days of Christ.

Its industries, products, and chief cities

Some of the mountain slopes are covered with forest; but most of the country is open, and suited mainly to herding, though there is some agriculture. In the valleys wheat, grapes, olives, figs, oranges, and cotton are raised, usually by the aid of irrigation. Both the herding and farming are carried on in much the same way as in the time of Christ. The valuable minerals are scarcely worked at all; and there is very little manufacturing except that done by hand (Fig. 464). Some of this work, however, like the Turkish rugs already mentioned (p. 337), is very beautiful.

Smyrna is the most important seaport. Locate it. Find Trebizond, an important port on the Black Sea.

Two especially important parts of Turkey in Asia

There are two parts of Turkey in Asia that merit special study on account of their history; namely, (1) the *Holy Land*, and (2) the valley of the Euphrates and Tigris rivers, or *Mesopotamia*.

1. The Holy Land

(1) *Its area, surface, and climate*

Estimate the length and average breadth of this noted little region at the east end of the Mediterranean Sea (Fig. 465). How does it compare with Connecticut in area?

Back of a straight coast, with no good harbors, lies a narrow coastal plain. Beyond this are two low mountain ranges, between which lies the remarkable depression in whose bottom the Dead Sea is situated. While the village of Hebron (Fig. 465), on the western mountain range, is about three thousand feet above sea level, the surface of the Dead Sea, a few miles to the east, is over thirteen hundred feet below sea level. This is, in fact, the deepest depression on the lands of the world.

Although fed by the river Jordan, which flows out of a fresh-water lake, called the Sea of Galilee (Fig. 466), the water of the Dead Sea is so salt that no fishes can live in it. The salt that it contains makes this water so dense that a person cannot even sink in it. The fact that the Dead Sea is so salt shows how arid the climate is. Otherwise its basin would be filled with water, which, by overflowing, would soon carry off the salt and make a fresh-water lake. The Jordan Valley and Dead Sea lie no farther south than southern Alabama; yet, partly be-

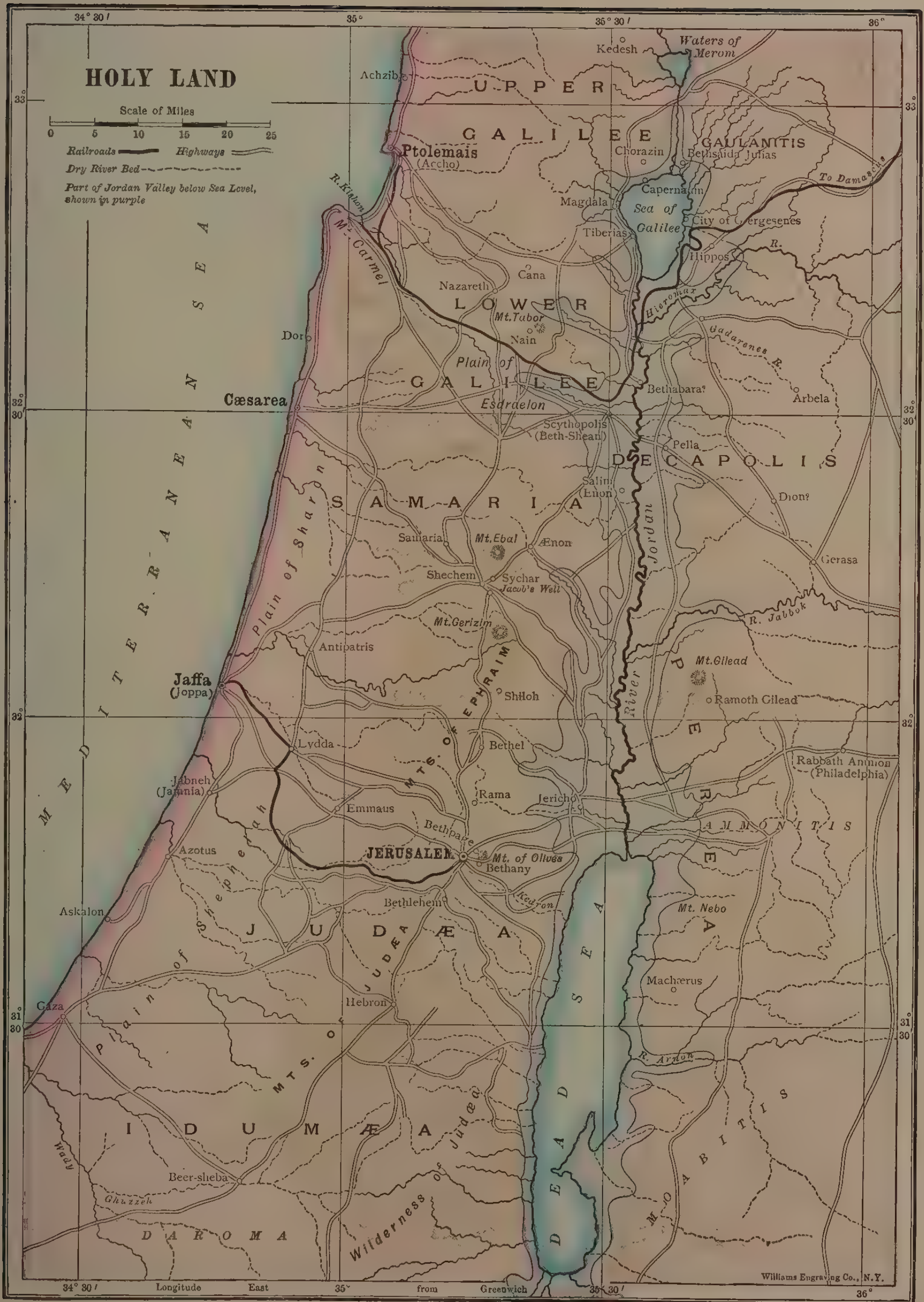

HOLY LAND
Scale of Miles
0 5 10 15 20 25
Railroads
Highways
Dry River Bed
Part of Jordan Valley below Sea Level, shown in purple
34° 30′
35°
35° 30′
36°
33°
32° 30′
32°
31° 30′
Longitude East from Greenwich
Williams Engraving Co., N.Y.
MEDITERRANEAN SEA
UPPER GALILEE
LOWER GALILEE
GAULANITIS
DECAPOLIS
SAMARIA
PEREA
AMMONITIS
JUDÆA
IDUMÆA
DAROMA
MOABITIS
DEAD SEA
Waters of Merom
Kedesh
Achzib
Ptolemais (Accho)
R. Kishon
Mt. Carmel
Chorazin
Bethsaida Julias
Capernaum
Magdala
Sea of Galilee
Tiberias
City of Gergesenes
Hippos
To Damascus
R. Hieromax
Cana
Nazareth
Mt. Tabor
Nain
Dor
Plain of Esdraelon
Gadarenes R.
Bethabara?
Arbela
Cæsarea
Scythopolis (Beth-Shean)
Pella
Salim
(Enon)
Dion?
Plain of Sharon
Samaria
Mt. Ebal
Ænon
Shechem
Sychar
Jacob's Well
River Jordan
Gerasa
R. Jabbok
Mt. Gerizim
Antipatris
Mt. Gilead
MTS. OF EPHRAIM
Jaffa (Joppa)
Shiloh
Ramoth Gilead
Lydda
Bethel
Rabbath Ammon (Philadelphia)
Jabneh (Jamnia)
Rama
Jericho
Emmaus
Bethphage
Shephelah
Azotus
JERUSALEM
Mt. of Olives
Bethany
Kedron
Askalon
Bethlehem
Mt. Nebo
Plain of Philistia
MTS. OF JUDÆA
Machærus
Gaza
Hebron
R. Arnon
Beer-sheba
Wady Ghuzzeh
Wilderness of Judæa

FIG. 465.

cause the region is so low and inclosed, its climate is almost tropical.

(2) Important events that happened here

Before its possession by the Jews, this region was divided into small countries, often under the rule of their more advanced and powerful neighbors in northeastern Africa, the Egyptians. Then the Jews entered this "promised land" and created a kingdom which rose to its highest power under King Solomon. It was here that many of the events in the Old Testament took place, including the advance in religion from the worship of many gods to the belief in one all-powerful God. Persians, Egyptians, and Romans later ruled over Palestine; and it was during the control of the latter people that Christ was born at BETHLEHEM (Fig. 467). What events in the life of Christ can you mention that occurred at some of the places marked on the map (Fig. 465)?

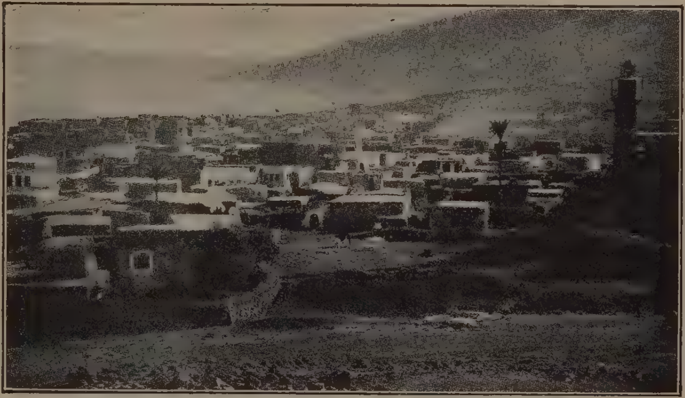


FIG. 466.—Tiberias and the Sea of Galilee in the Holy Land.

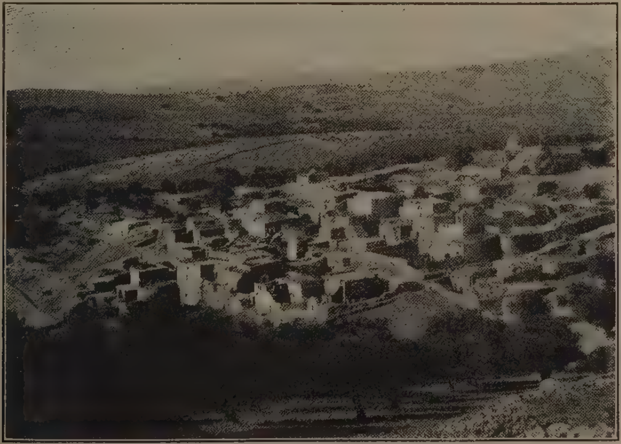


FIG. 467.—Bethlehem, where Christ was born.

(3) Former products and commerce of Palestine

At that time, as we learn from the Bible, the region was highly developed. Wheat was raised upon the uplands, and olives, figs, and grapes in the valleys, while herds of sheep were pastured on the plateaus and mountains. Recall events from the Bible that indicate these occupations.

Palestine lay on the great caravan route which, leading from Egypt to the distant East, ran northward, as far as DAMASCUS (Fig. 455), in order to avoid the Syrian desert. Throngs of people, therefore, passed this way. JERUSALEM (Fig. 468), the capital, was a large city, situated upon a lofty elevation that made it an important stronghold.

(4) Present attractions, and method of travel

Palestine is now visited by many Christians, and also by Mohammedan pilgrims who believe that Mohammed ascended to heaven from Jerusalem. Very little but ruins is to be seen, for much of the country, once "flowing with milk and honey," is now deserted.

The usual mode of travel is by mule or camel, as in olden times. A short railway now climbs the mountains from JAFFA, on the seacoast, to Jerusalem, and another has been begun following the old caravan route past NAZARETH and the Sea of Galilee to DAMASCUS. Trace these two lines.

2. Mesopotamia

(1) *Its ancient history*

This region, which includes the fertile valleys of the Tigris and Euphrates rivers, has suffered the same fate as the rest of Turkey in Asia. It was formerly a country of great resources, crossed by a network of irrigation canals, and was called in the Bible "a garden of the Lord." But it has been overrun by the Arabs and Turks, until it is now almost a waste. Babylon and Nineveh, once great cities, and the seats of a wonderful civilization, are now marked only by mounds of ruins. The site of the Tower of Babel is believed to be at Babylon, and the ruins of the palace of Nebuchadnezzar are still to be seen.

FIG. 468. — A view of Jerusalem as it appears to-day.

(2) *Its present importance*

Under such conditions there can be little commerce, though steamboats can go up the Tigris as far as BAGDAD. This city, situated on the caravan route to the East, was of much importance in ancient times. Some of its former importance may be brought back by the building of a railway from Smyrna to the Red Sea.

3. Arabia, Persia, and Afghanistan

Arabia

1. Surface and climate

The Arabian peninsula is a plateau, several thousand feet in elevation, with a fringe of mountains (Figs. 456 and 457), especially in the south and west. What waters border Arabia?

The climate is hot along the coast, but cooler on the plateau and among the mountains. A large part of the interior is desert, and almost everywhere the rainfall is light. Why (p. 211)?

2. Its former importance

Since the coast line is very regular, there are few harbors, and therefore few coastal cities. From early times, however, the inclosed seas which border the peninsula were favorable to navigation, as was the Mediterranean. Having learned the art of navigation, it is natural that, even in very early days, Arabian ships should have carried on commerce with Africa, India, and eastern Asia. For centuries the two great routes of trade between western Europe and the East Indies passed Arabia, one on the eastern side, through the Persian Gulf; the other on the west, through the Red Sea.

3. Mecca

Mecca, a city about fifty miles from the west coast, is sacred to all Mohammedans. It was here that Mohammed was born, and every Mohammedan wishes to make a pilgrimage to it at least once during his lifetime. Most of these pilgrims come by sea, and every year the city, as well as the roads leading to it, are crowded with them.

4. Population and products

With such an unfavorable climate there are, naturally, few people in Arabia, and these are largely nomadic. Coffee is raised in the southwest, near Mocha; the date palm flourishes in many places, and fruits and vegetables are produced in many of the valleys. Agriculture is possible in most parts only by means of irrigation. Cattle, sheep, goats, donkeys, horses, and camels are raised in large numbers, the last two being celebrated for their excellent qualities. There is very little commerce, and there are, of course, no navigable rivers. Why?

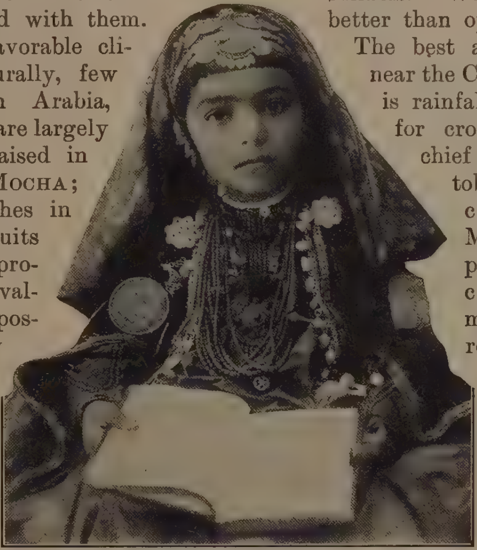


Fig. 469. — A Persian girl in native costume.

5. Government

Most of the Arabian peninsula is independent of Turkey, though it has no well-organized government of its own. Turkey controls the west coast and the Persian Gulf coast as far as *Oman*, a very small independent state whose capital is the seaport of Maskat.

The British have a foothold on the southwestern coast at Aden, one of their most important coaling stations. The climate here is so dry that there is not enough rainfall to supply drinking water, although great reservoirs have been built to store it. Part of the water for the city is obtained by condensing steam made by boiling sea water.

Persia

1. Surface and climate

Persia, like Arabia, is an elevated tableland, with large tracts of desert that are of little or no use to man. The arid climate prevents the formation of large rivers, but the rains and snows of the mountains supply enough water for irrigation in some of the broad valleys. There is so little rainfall, however, and evaporation is so rapid during the hot summer, that water for irrigation is often led from the mountains in underground tunnels. Why should tunnels be better than open ditches?

2. Agricultural products

The best agricultural district is near the Caspian Sea, where there is rainfall enough for crops. The chief farm products are tobacco, wheat, barley, cotton, and opium. Much raw silk is also produced, and roses are cultivated for the manufacture of attar of roses.

Nearly two million Persians belong to nomadic tribes (Figs. 459 and 470) which roam about the desert, dwelling in tents, and herding goats, sheep, and other animals.

3. Mining and manufacturing

Among the mineral deposits is the precious stone, turquoise, which has been obtained here for many centuries. Other valuable minerals are known to exist in Persia, but the country is so backward that there is little mining. Precious pearls and pearl shells are found in the waters of the Persian Gulf.

Almost the only manufacturing is that done by hand; and the Persians, like the Turks, do some very beautiful hand weaving, making such articles as shawls and rugs. Their carving and inlaid metal and wood work are also very artistic.

4. Government, and chief city

The government of Persia has long resembled that of Turkey, and has therefore been very bad. The ruler, the *Shah*, has been an absolute monarch, controlling the lives and property of his subjects, who are mostly Mohammedans. Recently, however, there has been a popular uprising and a demand for a more representative government. The Shah has promised a reform and has agreed to allow the people a voice in making their laws.

TEHERAN, the capital, has some beautiful mosques, but the dwelling houses, which are made of sun-dried bricks, and face narrow, filthy streets, are very unattractive.

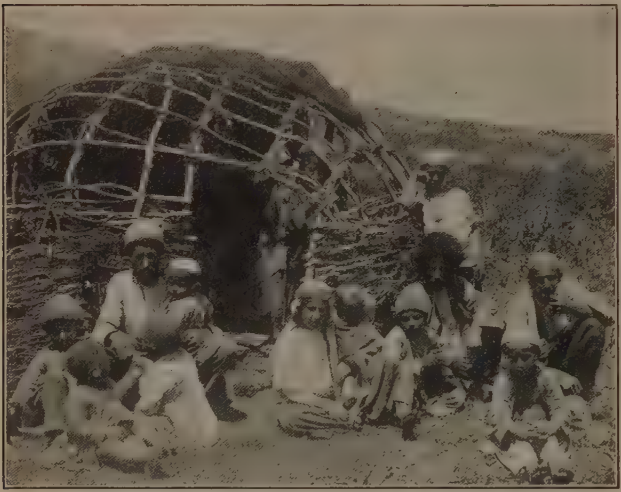


FIG. 470. — Persian nomads and their home.

Afghanistan

1. Surface, climate, and people

This country, "one of the waste places of the world," is a region of sand, bare rocks, and snow-capped mountains. Only in the valleys is the soil made to yield a harvest; and even there the cold, blustering winters and the dry, scorching summers make the worst of climates. Under such unfavorable conditions a race of people has developed which is noted for being hardy, stubborn, brave, and cruel.

2. Government

Like other Asiatic countries so far studied, Afghanistan is badly governed. The ruler, the merciless *Amir*, keeps his authority by means of the terror which he inspires. His seat of government is at KABUL, nestled among lofty mountains.

Since Great Britain has pushed her Indian frontier northward, while Russia has advanced on the opposite side of Afghanistan, this country is often called the "buffer state" between these two rival powers in Asia.

4. Russia in Asia

Area and divisions

This vast section of the Russian Empire includes about one eighth of the land surface of the globe.

There are several divisions, such as Turkestan and the dependencies of Bokhara and Khiva in the southern part; but by far the largest is Siberia, which is a million square miles larger than Europe. It is even larger than the United States, Mexico, and Central America combined. Yet Siberia has less than one twelfth as many inhabitants as the United States alone.

Principal belts of climate, and of plant and animal life

Russia in Asia has the same belts of climate as Russia in Europe (p. 303). South of the tundras is a vast forest belt, in which live many valuable fur-bearing animals, such as the sable, ermine, and fox. Few people live here except hunters and lumbermen. There are some farms in the clearings, and when the forests are removed, this will doubtless become a great farming region.

Still farther south are the broad Kirghiz steppes. There is rainfall enough for agriculture in the north, but toward the south, in Turkestan and Bokhara, the country becomes more and more arid. Here are extensive deserts, and arid wastes, with oases where irrigation is possible. Herding is the principal industry on the arid steppes and deserts, sheep, horses, cattle, and camels being raised. On the oases, corn, fruits, tobacco, cotton, hemp, and the silkworm are raised.

Importance in the past

In the past Siberia has had a reputation mainly as a source of minerals, and as a place of exile for Russians whom the government wished to punish. Gold has been found in a number of places, as in the Urals and near Lake Baikal, the largest fresh-water lake on the continent. Other valuable minerals are found here, but as yet there has been little mining, except in the western part near Russia. The southern provinces have been of high importance in the past, and Bokhara, though a Russian dependency, still has its own ruler. It was once a powerful state with highly developed industries, and to-day is one of the most progressive parts of Russia in Asia.

Why not more important

The immense territory of Russia in Asia has great resources; but there has been little advance except in the southern part. Perhaps the chief reason for this has been the lack of transportation. For a long time there were no railroads, and the rivers have been of little use for navigation. In the arid south they are small, and in the north, though large, they flow into a frozen ocean, and are themselves frozen for many months every year. This difficulty of transportation has kept out settlers; and it has made commerce very difficult. There was no object in raising large crops, if some of the products could not be sent away and exchanged for other things.

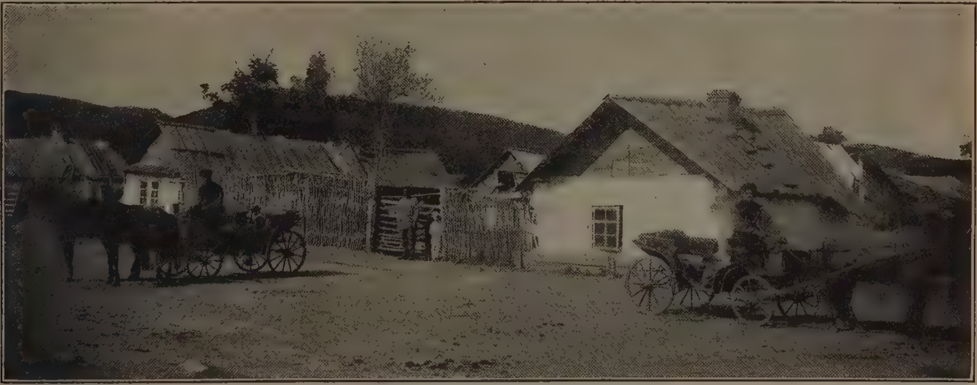


FIG. 472.—Russian carriages in a Siberian town.

Recent improvements, and prospects for the future

It was largely to overcome this difficulty that the Russian government built the great Siberian railway. Trace this railway on Figure 455. How long is it? On the one side it connects Siberia with Europe; on the other with the Pacific. Other railways have been built in the southern part of the country, and still others have been planned.

FIG. 471.—A Yakout woman from the cold tundra region of Siberia.

In order to have a port on the Pacific which should be free from ice, Russia crossed the Chinese territory, in Manchuria, to PORT ARTHUR. China was too weak to prevent this. Russia also began to push her influence into Korea, when Japan objected, and this led to a war in which Russia was badly defeated by Japan.

This war has seriously checked the progress of Russia in Asia, but it cannot be for a long time. Now that it is possible for people to enter this vast territory to develop farms and mines, and to ship the surplus products, Russia in Asia will doubtless advance rapidly. The one great difficulty still in the way is the bad government, which, as you have learned (p. 304), is opposed to the progress of the people.

Leading cities

There are several important cities in Asiatic Russia. The largest in the southwest is TASHKEND, and the city of BOKHARA is next in size. TIFLIS, between the Black and Caspian seas, is really in Asia, though the Russian government classes this region with its European provinces. It is somewhat larger than Tashkend. There are a number of other cities with a population of from fifty to a hundred thousand. In Siberia there are no large cities, though several along the railway, including IRKUTSK and VLADIVOSTOK, are now growing rapidly.

5. The Indian Empire and Ceylon

Divisions of the empire

The Indian Empire includes not only the entire peninsula of India, but the desert country of *Baluchistan* on the west, and fertile *Burma* on the east. The two little countries of *Nepal* and *Bhutan*, among the Himalaya Mountains on the north, have retained their independence, largely because they are so protected by the mountains. They are, however, to some extent under the protection of the Indian Empire.

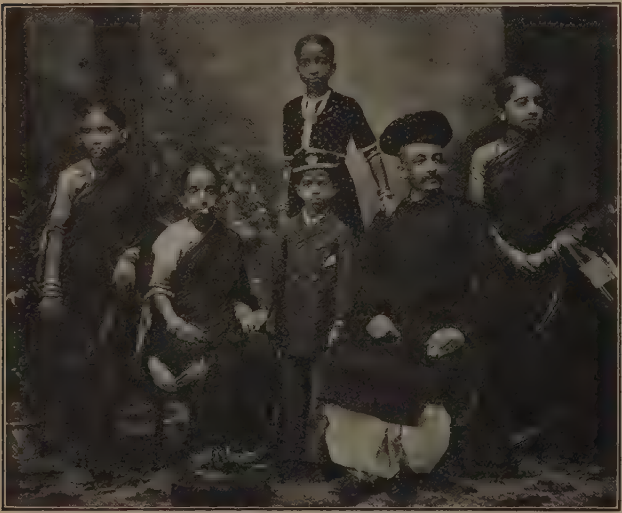


FIG. 473. — A family of Indian Brahmans of high caste.

Surface features

There are three extensive areas in India of very different altitudes. (1) Most of the peninsula is a plateau, rarely more than two thousand feet high. (2) North of the plateau is a broad lowland occupied by the Brahmaputra, Ganges, and Indus rivers, which, like the Po River of Italy, have built up the plains out of sediment brought from the mountains. (3) To the north of the river plains are lofty mountains, the highest being the Himalayas. In these mountains are scores of peaks that reach an altitude of over four miles. Even the mountain passes are from seventeen to nineteen thousand feet above sea level, or much higher than Mont Blanc in the Alps.

The coast of India is remarkably regular, and there are, therefore, few good harbors.

Climate

It must be remembered that, while India lies partly in the trade wind belt, the monsoons here largely take the place of those winds (p. 218). In summer the monsoons blow from the southwest, toward the heated lands; in the winter, from the opposite direction.

The western coast of the peninsula, therefore, has a heavy rainfall in summer (Fig. 309). There is also an abundance of rain in the south and at the base of the Himalayas. Here, just west of Burma, is the region which has the heaviest rainfall in the world. Much of the peninsula, however, especially the western side, suffers for want of rain in winter. It becomes so dry here that plants wither, and in northwestern India and Baluchistan there is an extensive area of true desert.

People

1. Density of population

There are 315,000,000 inhabitants in this empire, which has an area of about 1,789,000 square miles, or somewhat more than half that of the United States. It will be seen, therefore, that there is an average of 178 persons for every square mile. In parts of the country there are 500 persons per square mile. How dense this population is can be better understood, if we recall that there are only nine persons per square mile in the United States. There are, in fact, more people in India than in North America, South America, and Africa together.

2. Races to which the people belong

India was once inhabited by a swarthy race, which was gradually replaced by Aryans, or people of the white race from the north. Now the greater part of the population belong to the latter race.

Although the country has been protected by the sea and by the mountains of the north, a break in the mountain barrier in the northwest has permitted attack from that direction. One of these invasions was by the Mongols, who introduced Mohammedanism into northern India. The capital of their empire was DELHI, and it is said that the present Delhi is built upon the ruins of ten older cities.

3. Their religion and superstition

India is the home of *Brahmanism*, the religion of about three quarters of the people, while a little over one fifth are Mohammedans. There are only about nine million Buddhists and three million Christians. As already stated (p. 233), Brahmanism teaches the belief in *caste*, which is quite different from our belief that all men are born free and equal. The caste system has been a serious obstacle to the development of the people. How?

The people of India have many religious superstitions. For example, the Ganges, doubtless because of its great value for irrigating and fertilizing the soil, is considered a sacred river, and bathing in its waters is supposed to wash away disease. Since the waters are also used for drinking, this custom is no doubt responsible for the spread of much disease. The devout Hindu makes at least one pilgrimage to the holy river as a means of gaining divine favor and forgiveness.

Government

1. How the English obtained control

Over three hundred years ago a company of London merchants gained a foothold in India for trading purposes. At that time the peninsula was divided among many native rulers, and the British government was often called upon to settle disputes among them. Partly in this way, and partly in protecting British subjects engaged in the Indian trade, Great Britain gradually increased its control of the peninsula. India received its present form of government in 1858, and in 1876 the Indian Empire was formally made a part of the British Empire, the queen of the United

FIG. 474. — An Indian woman of low caste.

Kingdom taking the additional title of Empress of India.

2. How they have been able to keep control

The entire population of India is over seven times that of the British Isles; and in India itself there is but one British resident to every three thousand native inhabitants. One might expect that so few foreigners would find great difficulty in controlling so many people. But that has not usually been the case.

One reason for this is that the British nation is united and strong, while the Indian people, in spite of their numbers, are separated and weak. The caste system is partly responsible for this, for it tends to keep the people apart instead of drawing them together for a common purpose.

Aside from this, the British have done much to improve the country, and they have shown great wisdom in their government of the people. For instance, they have not attempted to overturn the numerous native states, nor to interfere seriously with the established customs. A number of the native states retain their rulers, and are treated as dependencies. The British have also appointed Hindu officers to as many government positions as possible, and now by far the greater number of such offices are held by natives. As in the case of Canada, a governor general, called the *Viceroy*, is sent from Great Britain as chief executive officer.

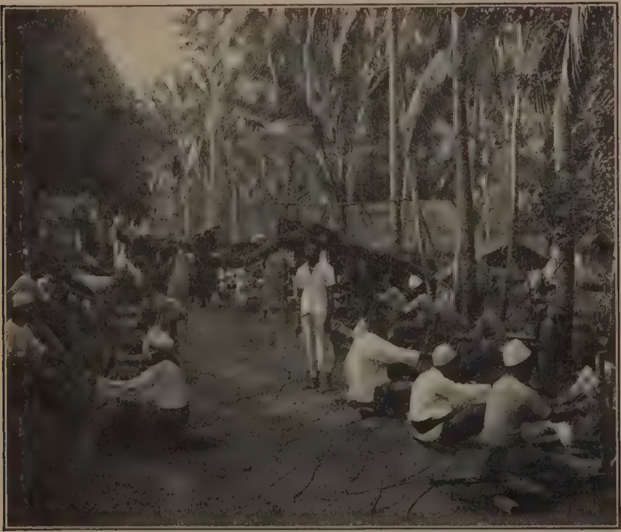


Fig. 475. — Natives preparing rattan in the tropical part of southern India.

The forests and their products

There are valuable forests on the mountain slopes, where the trees, including pines, firs, and junipers, resemble those of Europe; and there are also magnolias and the beautiful deodar, a species of cedar. In the hotter portions are plants valuable for medicines, also spices, such as pepper and cinnamon. The teak, with strong, durable wood, of use in building ships and for other purposes, and the mango, whose fruit is important as a food, are both common. Besides these, the bamboo and various palms are of great value. The bamboo is used in hundreds of ways in making implements and building houses; and the palms supply juices for drink, fiber for ropes and mats, and cocoanuts (Fig. 461) for food and oil.

In parts of the Ganges valley, and elsewhere, there are *jungles*, or tracts of waste land densely covered with bamboos, canes, etc. From these wastes the lion has almost disappeared; but the elephant is still found, and there are various species of the monkey, also the rhinoceros, buffalo, leopard, wild boar, wolf, and Bengal tiger (Fig. 476). The tiger is much dreaded, for it not only preys upon cattle, but even attacks men. Among the Himalayas, goats, sheep, asses, and dogs still exist in a wild state. Crocodiles live in the rivers, and poisonous serpents are abundant. It is said that as many as twenty thousand persons are killed each year by the bites of snakes, especially the venomous cobra di capello (Fig. 460).

FIG. 476. — The tiger, one of the wild animals of southern Asia.

Agriculture

1. Farm products

From the very earliest times the people of India have been engaged in farming, and at present fully three fifths of them follow that occupation.

Millet, which grows on the drier lands, and rice, which is raised on the river lowlands where the land can be flooded, are the staple foods of the natives. After the vast number of inhabitants are fed, however, there is little left, though some is exported. Wheat is also raised for export, and India is an important granary for Great Britain. Much cotton is also produced. Some of this is manufactured into coarse fabrics for use at home, and for export to China and Africa. But a large amount is exported, as raw cotton, for use in the cotton mills of Great Britain. Other agricultural products are sugar cane, tobacco, opium obtained from a species of poppy, indigo of value as a dye, and jute grown upon the sandy river bars for the sake of its coarse, strong fiber.

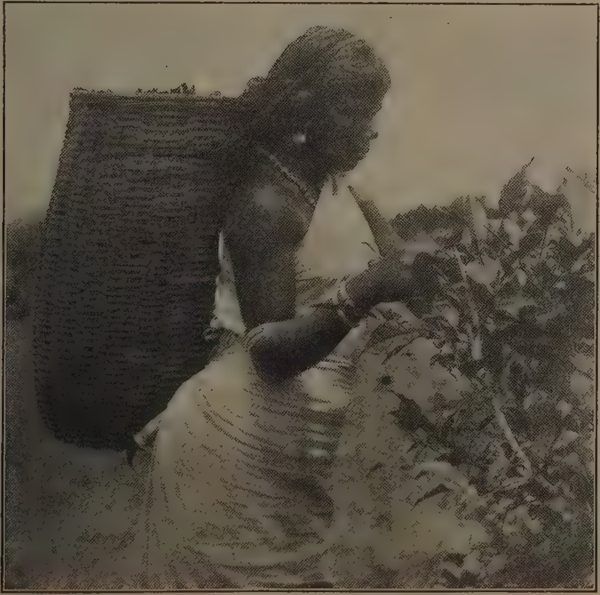


FIG. 477. — An Indian woman picking tea leaves.

Much tea is raised on the hills of the very rainy region at the base of the Himalayas, south of Bhutan (Figs. 477 and 478). Tea requires a hot climate, an abundance of rain, and slope enough to prevent the water from standing around the roots of the plant. The tea plant, which is from two to four feet high, has bright green leaves resembling those of a rosebush. The leaves are picked several times a year, in many cases by boys and girls. After being picked, the leaves are dried in the sun, and later under cover, in order to remove all moisture before packing.

2. Development of irrigation

Irrigation is necessary for the production of rice, and in the drier sections for other crops as well. Therefore this country, favored with large rivers fed by the rains, snows, and melting glaciers of the mountains, has some of the most extensive irrigation works in the world. Where the streams are small, as on the plateau,

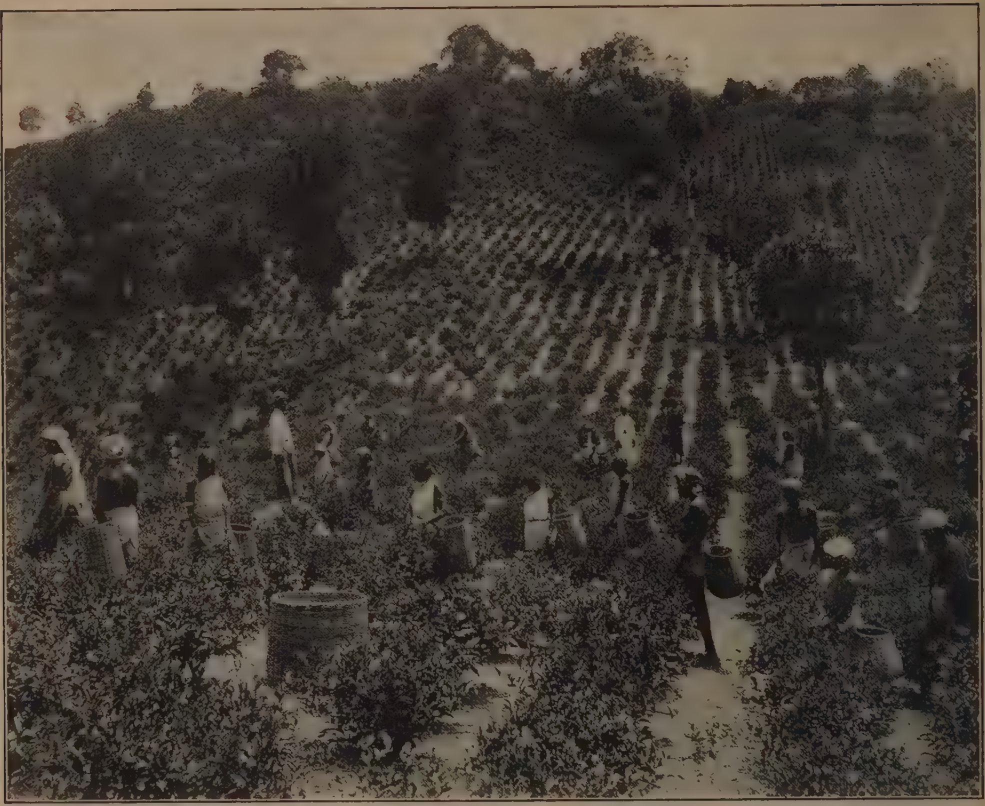


FIG. 478. — Natives picking tea in a tea plantation in India.

there are large reservoirs for storing the flood waters, such as our government is now building in the West.

3. Danger of famines and plagues

Although these people are so extensively engaged in agriculture, now and then, when rain fails, they do not raise enough food for their own use. Then terrible famines result. Sometimes one section suffers, while another has an abundance of food.

With the building of railways the danger of famines becomes less, for railroads bring different sections more closely together. The first line was begun in 1854, and there is now a network of railways across the peninsula (Fig. 455). Even the railways do not entirely remove the danger; and probably famines will not cease, so long as such vast numbers depend solely upon the products of the soil.

India has also been visited by plagues which have destroyed tens of thousands of lives. With a population so dense, in a climate so hot, disease spreads rapidly and with terrible effect. This is especially true among people who are not properly nourished.

Mining and manufacturing

In addition to the raw products of farms and forests, there are valuable minerals, including salt, petroleum, coal, and iron.

India has long been noted for hand-made goods of great beauty; but with the exception of these there is little manufacturing. Of late, however, the manufacture of cotton goods by machinery has been increasing. It is natural that this kind of manufacturing should develop here, as in our Southern States. Why?

Large cities

1. Their number

So many Hindus are engaged in farming that only about five per cent of them dwell in large towns. Nevertheless, there are eighty-three cities with a population of over fifty thousand, while one, Calcutta, has over a million inhabitants, and two others, Bombay and Madras, over half a million each.

2. Cities on the Ganges and Indus rivers

CALCUTTA is a seaport on the Ganges delta. It is the natural outlet of the fertile Ganges valley, but has a poor harbor on a river that varies greatly in volume. Since the city is situated near coal fields, there is some manufacturing, but Calcutta is chiefly important as a commercial center and as the residence of the Viceroy.

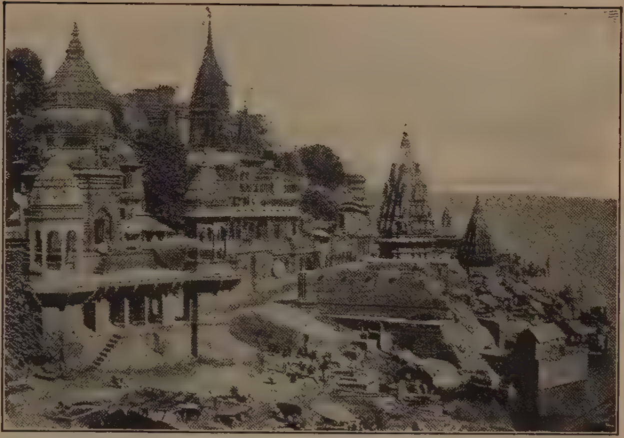


FIG. 479. — Temples on the banks of the Ganges at Benares.

Farther up the Ganges are two smaller cities, LUCKNOW and BENARES. The latter,

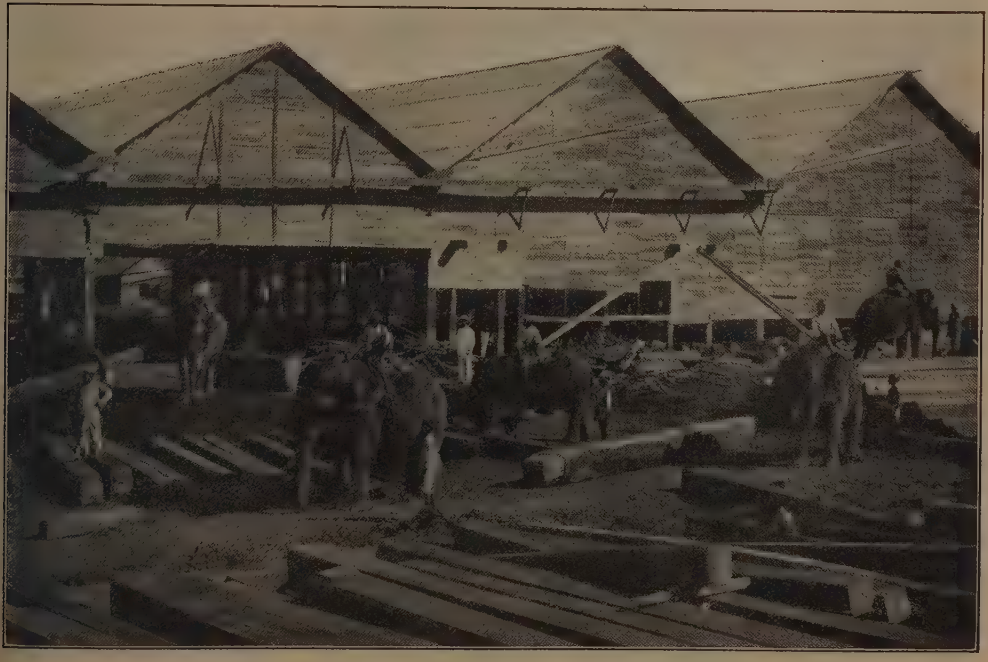


FIG. 480. — Elephants moving logs in a lumber yard in Burma.

the "holy city of the Hindus," is on that part of the Ganges which is deemed most holy. At this point temples (Fig. 479) line the banks of the river for miles, and a steady stream of pilgrims pours in and out of the city.

While there are several cities on the Ganges, there are no large ones on the Indus. This is not because the Indus is useless for irrigation, but largely because its shallow waters and sand bars interfere with navigation. This condition of the river is due to the fact that much of the water is lost by evaporation in crossing the arid plains.

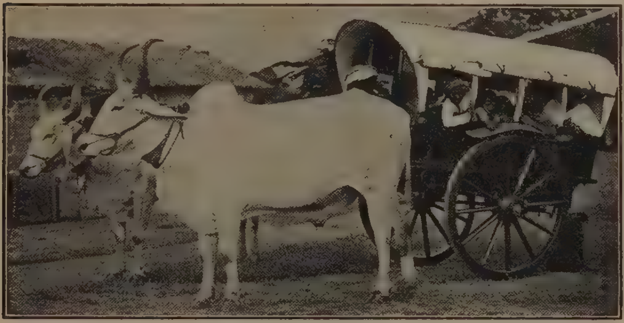


Fig. 481. — Native buffalo used for drawing wagons in India.

3. Bombay and Madras

Bombay, next in size to Calcutta, and the nearest port to England, is a great business center. It is, moreover, the only Indian city with a really good natural harbor. Madras, the third largest city, is situated at a point where there is only an open coast protected by a breakwater. Delhi is the capital.

Burma

In Burma there are many Mongolians. Can you suggest a reason for this fact? Vast quantities of rice are raised; and there are other valuable products, such as rubies, sapphires, and tropical woods. In Burma the elephant is used for moving logs (Fig. 480), drawing plows, and carrying passengers. Native humped cattle are also much used as work animals (Fig. 481).

Rangoon, the seaport, is important for its export of rice, but Mandalay, farther up the Irawadi River, is the largest city.

Ceylon

Ceylon, with its fertile soil, abundant rainfall, and high though equable temperature, is a beautiful tropical garden. It was considered by the Arabs to be the Garden of Eden. Among the products are cocoanuts, rice, fruit, coffee, and tea. The island is the third most important tea-producing section in the world. Other products are sapphires and rubies from the stream gravels, and beautiful pearls and mother of pearl from shellfish which live among the coral reefs.

6. Indo-China and the Malay Peninsula

Surface and principal divisions

This peninsula is crossed from north to south by a series of mountain chains, spreading fan-shaped southward. Between these ranges are long, narrow valleys, which broaden toward the south and end in fertile, populous delta plains at the river mouths.

In addition to Burma, which is a part of the Indian Empire, there are three divisions of this peninsula: (1) *Siam*, (2) *French Indo-China*, and (3) the British Colonies of *Straits Settlements and Malay States.*

Siam

1. Its products

Most of the inhabitants of this tropical country, who are either Chinese or Malays, live along the rivers and irrigation canals. They are chiefly engaged in the cultivation of rice, but millet, which is raised in the drier places, competes with rice in importance as a food. Among the mineral products are rubies, sapphires, gold, and tin. The forests yield tropical woods, especially teak wood, both for use at home and for export.

2. Its government and chief city

Siam is a monarchy, the king being assisted by a council of ministers and by a legislative body of noblemen. The poorer classes are still kept in a kind of serfdom by the local governors; that is, they may be forced to work for the governors two or three months each year.

BANGKOK, the capital and largest city, is situated on the banks of a muddy river, up which vessels of small draught are able to reach the city. Most of the inhabitants live either in poor houses on narrow, ill-kept streets, or else in boats and floating houses on the river. But the king has magnificent palaces decorated with carved marble and frescoed with gold.

Buddhism is the religion of the country, and in Bangkok alone there are said to be ten thousand Buddhist priests whose temples are gorgeously decorated with gold, silver, and jewels. Next to the king, the white elephant is held in highest reverence, and Siam is often called "the Land of the White Elephant."

French Indo-China

French Indo-China resembles Siam both in climate and character of people. Its forest-covered hills yield valuable teak and iron wood, and in its valleys are extensive fields of rice and millet. Silk, cotton, tea, and spices are other products, and there are also extensive coal beds. Some coal is exported.

Straits Settlements and Malay States

The Straits Settlements and Malay States are the two names given to the British possessions on the southern end of the Malay Peninsula. In that hot, damp country, so near the equator, such tropical products as rice, cocoanuts, rubber, and spices are obtained. Extensive deposits of tin are found in this region, which supplies more than half the tin used in the world. The mining is done crudely by Chinese, while the native Malays are mainly engaged in farming and fishing. The only city of importance is SINGAPORE.

7. Republic of China

Area and population

This republic, which is considerably larger than the United States, has more inhabitants than any other nation in the world. It includes over half the population of Asia, and has fully forty million more people than live in all of densely settled Europe.

Distribution of population

In spite of this vast population, there are some sections where there are few people. This is true, for instance, of Tibet, Turkestan, and Mongolia, which together make up half of the republic. On the other hand, vast hordes of Chinese live on the river flood plains and deltas of the south and east, making this the most densely settled large area on the globe.

Reasons for such distribution

1. Why so few people in the north and west

The northern and western half of the republic is a region of plateaus, in some places as high as most mountains, and crossed by many mountain ranges (Fig. 457). Not only are the elevated portions cold, but a large part of the region is also arid. For, while much rain falls on the edge of this vast highland, little reaches the interior. The climate, therefore, is unfavorable to all industries save herding, and there are large areas, as in the Desert of Gobi, where even that is impossible.

2. Why so many in the east and south

In the east and south there is much low, level, and very fertile land. The extensive flood plains of the two great rivers, the Hoang-ho and the Yangtse-kiang, are especially rich. Most of this part of China, also, has a temperate climate, with an abundance of rain during the summer monsoon. In the north, for example near Peking, which is in about the same latitude as Philadelphia, the summers are warm and the winters cold; but farther south, as at Canton, just south of the Tropic of Cancer, the climate is tropical. Here rain is abundant throughout the year.

While the flood plains and deltas make excellent farm land, they are in constant danger of being flooded, and are therefore not very safe places in which to live. The Hoang-ho, for instance, may rise as much as forty feet in summer, and sometimes it becomes impossible to control it. In the last twenty-five hundred years its lower course has changed eleven different times, and in some cases this has caused a change of three hundred miles in the position of the river mouth. A single flood destroyed a million lives. Because of the repeated destruction of life and property due to such floods, the Hoang-ho has been called "China's Sorrow."

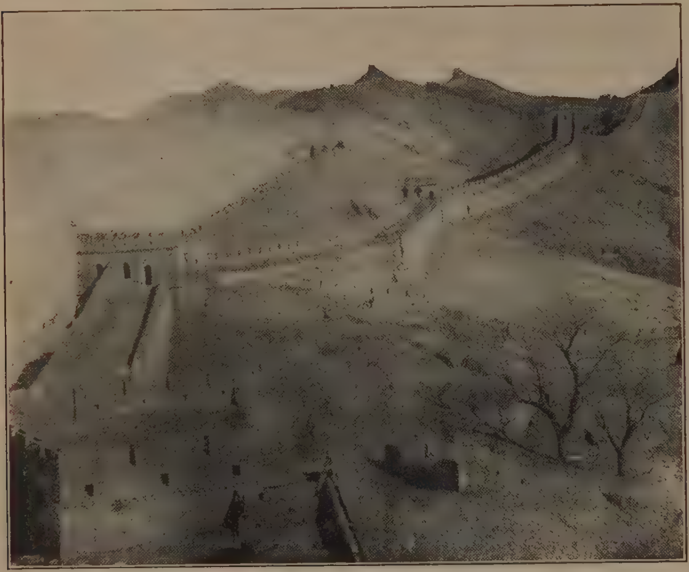


FIG. 482. — A view of a part of the great Chinese wall.

Another danger on the low delta plains is from great sea waves, driven before the winds of fierce storms, called *typhoons*, which sometimes visit the China sea in late summer and early autumn. These storms are like the hurricanes which start in the West Indies, and, sweeping along our southern coast, often cause great destruction. The typhoons of Asia, most of which start in the East Indies, also cause great destruction of life and property.

Character of the people

1. Their early advance

Centuries before Europeans had risen above a state of barbarism, the Chinese had developed a remarkable civilization. The art of printing, the manufacture of gunpowder, the production of raw silk and silk goods, the baking of porcelain, or *china ware*, and other important arts were known to them long before Europeans learned them.

2. The great wall that they built

The peculiar energy of the Chinese is shown by the great wall that they built (Fig. 482). Having the ocean as a barrier on the south and east, the country has been most open to attack from the north and west, in spite of the barriers of mountains and deserts on that side. It was probably from this direction that China was entered by the Mongolians, who now make up the main part of the population. The constant danger of invasion by nomads led, as early as 212 B.C., to the building of the Great Wall along the northern frontier (Fig. 455).

This wall, twelve hundred miles long in a straight line, and fifteen hundred miles with all of its windings, leads up and down hill (Fig. 482), and even over a mountain peak. It is twenty-five feet wide and thirty feet high, and every few hundred feet there are strong watchtowers rising still higher. This wonderful structure, which required armies of men to build, is now over two thousand years old; yet many parts of it are still perfect.

FIG. 483. — One of the Chinese rivers on which commerce is carried by the use of sail and row boats.

3. Their old-fashioned customs

Notwithstanding their ancient civilization, the Chinese have been outstripped by Europeans (p. 347). This is largely due to the fact that the Chinese have a decided dislike for new things and new customs, as is shown in their objection to the use of labor-saving machinery, and to new methods of transportation, such as the railway. Much of the commerce of the country is carried on by means of canals (Fig. 488), of which the largest is the Grand Canal (Fig. 455), built more than twelve hundred years ago. The rivers are also used (Fig. 483), even where it seems almost impossible for a boat to go; but poles, oars, and sails take the place of steam.

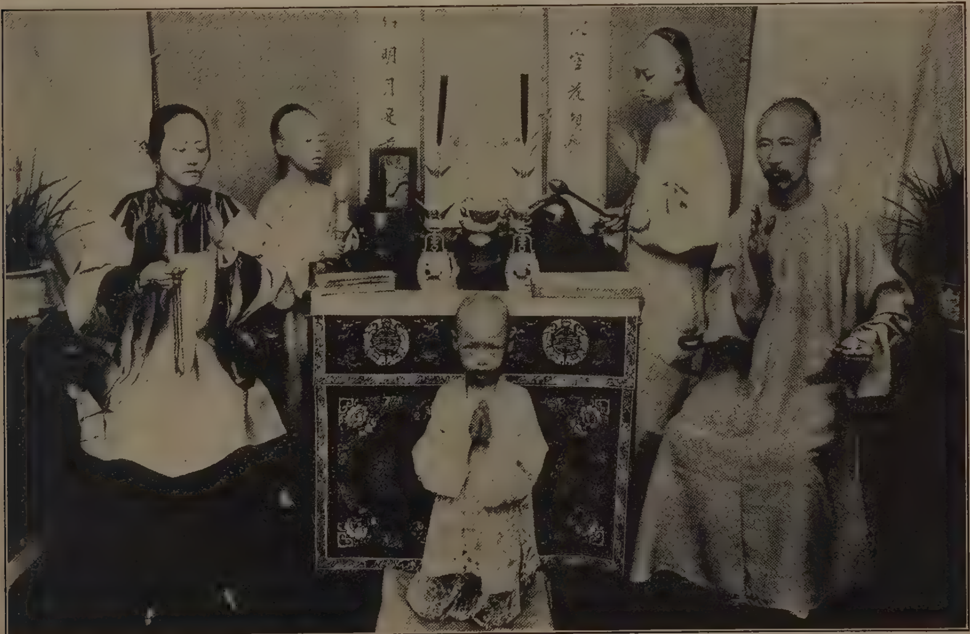


Fig. 484. — A Chinese family engaged in ancestor worship.

Good roads are rare, and one of the principal vehicles is the wheelbarrow, which is used even for carrying travelers. There are, for example, two thousand passenger wheelbarrows in Shanghai. Pack animals and men are employed for carrying loads, and the wealthy classes are carried in chairs by their servants. From this it is plain that a man's time in China is not valued highly.

4. Reasons for such backwardness

The Chinese are followers of Confucius, and his doctrine is everywhere taught. In fact, it has not been possible for a man to hold office under the government until he had passed an examination in the teachings of Confucius.

(1) The teaching of Confucius

One of the doctrines of Confucius is ancestor worship (Fig. 484), which leads them to regard new customs as bad. This tends to check progress, and is one of the reasons why the Chinese have refused to adopt European and American civilization. This worship of ancestors is so strongly established that disobedience to parents is regarded in China as one of the worst of sins, for which children may be whipped to death. By law, the punishment for striking a parent is death.

Strangers, therefore, who represent new

customs, have never been welcome. Some parts of the Republic of China have been especially difficult for foreigners to enter. Until very recently, for instance, the holy city of LASSA in Tibet, a dependency of China, is said to have been visited by only three Europeans. The inhabitants wished to save their city and its sacred temples from intrusion, and they captured and even tortured those whose curiosity led them there.

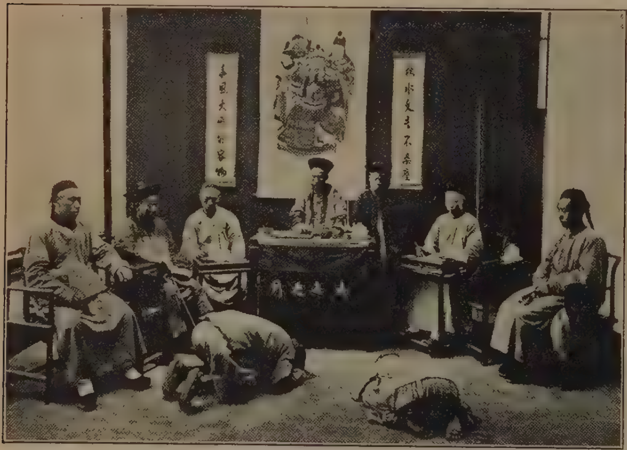


FIG. 485. — Scene in a Chinese court at Shanghai. The prisoners are on their knees before the judge.

(2) *The fear of want of work*

Another reason for such backwardness has been the fear that the introduction of steam and machinery might throw the people out of work. The strength of this fear was shown some years ago when the Chinese government finally gave permission for a railway to be built. The people objected so strongly that the railway was destroyed.

(3) *The injustice of foreigners*

China has suffered very unfair treatment from some of the European nations, which have seized and held Chinese territory. Partly for this reason, the hatred of "foreign devils" finally became so great that in 1900 large numbers of the people, called *Boxers*, arose and tried to kill or expel all foreigners then in the country. It was necessary for the United States and the nations of Europe to send troops to protect their citizens.

Since then the Chinese have begun to change greatly. Now they are inviting foreigners to China, and are sending many of their young men to Europe and the United States to study. Railroads are being built, mines opened, and factories started. It seems as if, at last, China had awakened from her long sleep.

Government

Until 1912 the Chinese government was an absolute monarchy, with a governor, or *viceroy*, for each province, one of whose duties it was to collect money for the government, but who, in some ways, was independent. The Emperor was not a Chinaman, but belonged to the Manchu division of the yellow race, which invaded and conquered China in 1644. It was then that the Manchu custom of wearing a long queue, or "pig-tail," was introduced into China. This form of government finally became so unpopular that the Chinese rose in rebellion, and established a republican form of government. It is thought now that with this popular government great progress will take place in China.

Fishing and agriculture

Many Chinese are engaged in fishing, both in the rivers and on the ocean. But they are, in the main, a farming people. The methods employed are very crude, but the Chinese are so careful and industrious, and labor is of so little value, that they till every bit of land possible. For example, instead of leading water for irrigation only to land of moderate slope, as in the United States, they often take it to the very hilltops. It is first raised from the river by means of wheels, turned either by men or by buffaloes, and then pumped upward from one terrace to the next, until the whole hillside has been watered.

The principal food of the Chinese is rice ;

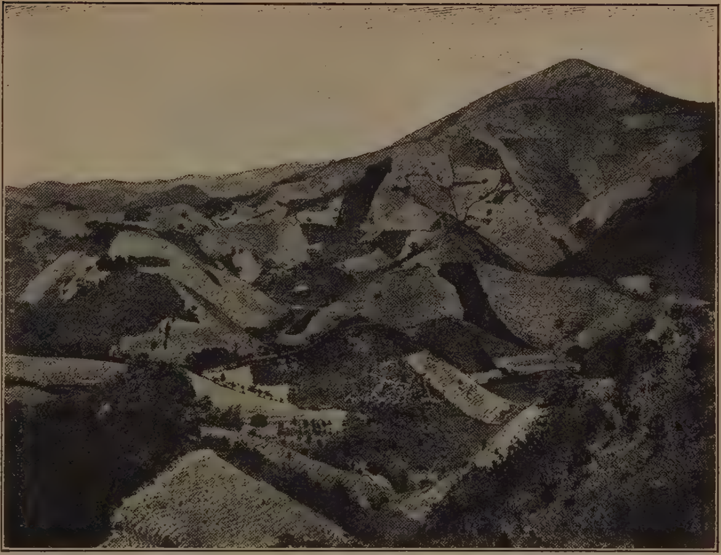


FIG. 486. — Chinese farm land. These steep hill slopes are carefully terraced and every bit of soil that can be used is cultivated.

but their main products for export are tea and silk. Tea is raised on the damp hill slopes of the south, where the conditions resemble those in India (p. 357). Fully forty thousand men and women are employed in carrying tea into FUCHAU alone. They receive but ten cents a day for their labor.

In the warm southern portion of the country, as in France, great quantities of raw silk are obtained from the cocoon of the silkworm caterpillar. Some of the caterpillars feed on forest leaves; others on the mulberry leaf.

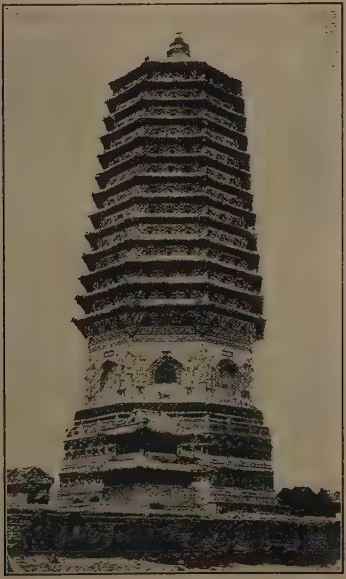


FIG. 487. — A Chinese pagoda or temple, where the people worship.

Mining and manufacturing

It is said that China contains the largest coal fields in the world, in which both bituminous coal and anthracite are found; and there are also deposits of gold, silver, lead, and iron ore. At present, however, little use is made of these mineral resources.

As in other countries of southern Asia, the bamboo is one of the most valuable products. The seeds are ground up for food, and in spring the tender roots and stalks are eaten. The roofs and walls of houses (Fig. 488), as well as nearly all articles of furniture, are made of bamboo wood. It is, moreover, woven into mats, baskets, and hats, while paper is made from its pulp.

The Chinese are an artistic people, and they make some very beautiful china ware and silk fabrics; but they still do most of the work by hand, as has been the custom for thousands of years.

There are so many people in China, they are so industrious and intelligent, and there are such vast resources, that when China once adopts modern methods of manufac-

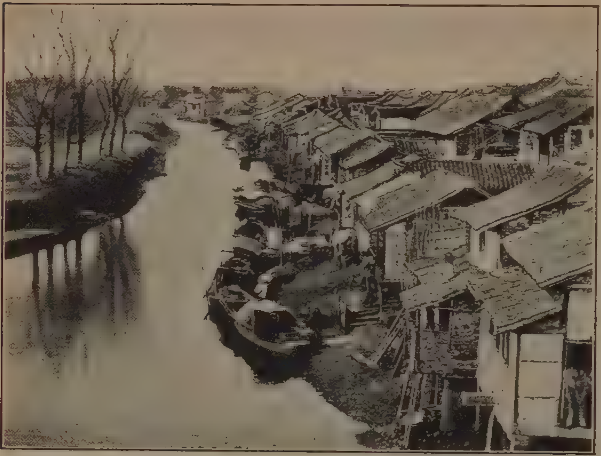


Fig. 488. — A Chinese village, with bamboo houses, on the banks of a canal.

turing and commerce, she will surely take a leading place among the nations of the world. It may even happen that China will then be able to make and sell goods more cheaply than can be done in Europe or America.

Leading cities

1. Canton and Hongkong

There are many densely crowded cities in China. The poorer people live huddled together, while the wealthier classes and officials dwell in comfort and luxury. One of the largest cities is Canton, situated on a densely populated delta, and a port of outlet for southern China. Many scores of thousands of people live in boats moored in the river. Canton is especially noted for its silk.

Hongkong, an island which commands the approach to Canton, belongs to the British. Many of the products of China are sent from this port to Europe and America.

2. Cities on the Yangtse-kiang River

Hankau and Wuchang, on the Yangtse-kiang River, are important river ports for tea. Here, as in the case of most Chinese cities, the number of inhabitants is uncertain. For example, by some estimates Hankau has a population of over a million, by others, only half a million. Shanghai is another large city. It is a *treaty port;* that is, one where foreigners are allowed by treaty to carry on trade; for this is not permitted in all Chinese cities.

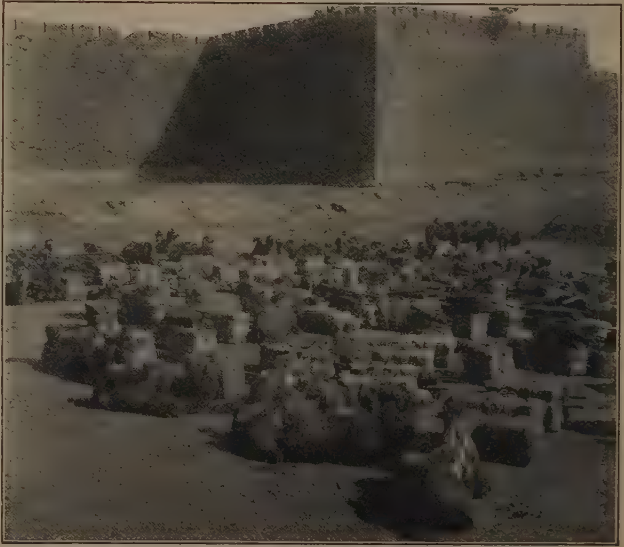


Fig. 489. — A caravan of camels, outside the walls of Peking.

3. Peking and Tientsin

Peking, the capital of China, is situated on a broad, sandy plain. It has been the capital of a kingdom for three thousand years, and the capital of the Chinese Empire for over eight centuries. This city, like others in China, is surrounded by a high wall with gates that are closed at night, as was the case in European cities in olden times (Fig. 489). One portion of the city, formerly reserved for the gardens and palaces of the emperor, is known as the "Forbidden City," because before the Boxer uprising the Chinese government refused to permit foreigners to enter it.

TIENTSIN, the port nearest PEKING, and the northern terminus of the Grand Canal, is another important seaport. It was from this point that the European and American forces started, in 1900, to relieve the foreigners who were besieged in Peking by the Chinese Boxers.

8. The Japanese Empire and Korea

Parts of the empire and importance of their location

The two principal islands of Japan are Nipon and Yezo; but the empire extends as far south as Formosa, which was captured from the Chinese in the war of 1894. On the north it includes the Kurile Islands, as well as the southern half of Sakhalin, which was ceded to Japan by Russia at the close of the war of 1904–1905.

The position of this empire, a short distance from the mainland, has secured to the Japanese some of the same advantages that the British have enjoyed. That is, it has protected them from many invasions, while it has also given them a very favorable position for commerce. No part of the empire is far from the sea, so that shipment by water is easy. Estimate the greatest length of the empire from north to south. Is the fact that the islands are so scattered an advantage or a disadvantage, as compared with the British Isles?

Area and population

The combined area of the islands is almost a hundred and fifty thousand square miles. How does that compare with the area of the British Isles? Of New England? Of California?

The population is more than fifty-one million. Thus the empire contains only a few million more than the British Isles. How does this compare with the population in New England? In California?

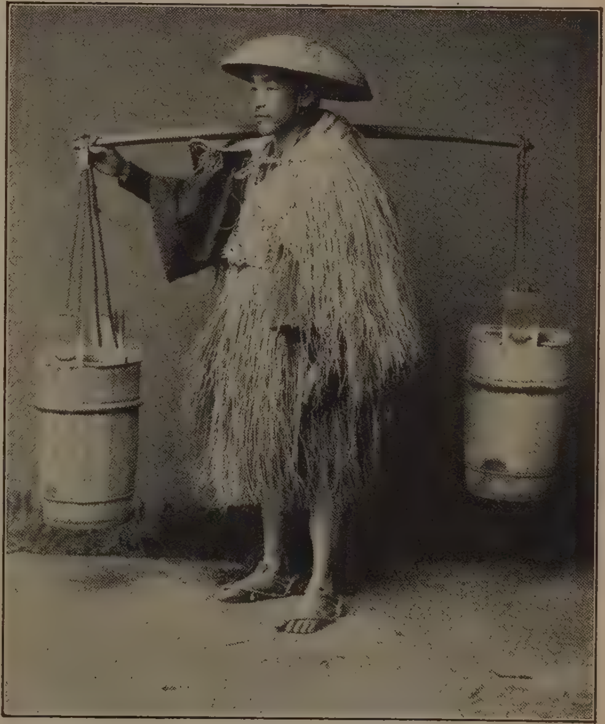


FIG. 490. — A Japanese coolie carrying water.

Surface and climate

So much of the surface is mountainous, that not more than one sixth of it can be cultivated. Moreover, the rugged surface, and the absence of navigable rivers, make it difficult to reach some of the towns and villages of the interior.

There are numerous volcanoes in the Japanese Islands (Fig. 458); and, since the mountains are still growing (p. 342), there are many earthquakes. These are so frequent and violent that the Japanese build their houses of light materials, and to no great height, so that they resist the shaking, and cause less destruction of life if they fall.

In what latitude does Formosa lie? How far is it from the Philippines? What is the latitude of the northern portion of the empire? From these facts it is plain that Japan has a more varied climate than the British Isles. What must be the effect on the kinds of crops, compared with the kinds in Great Britain?

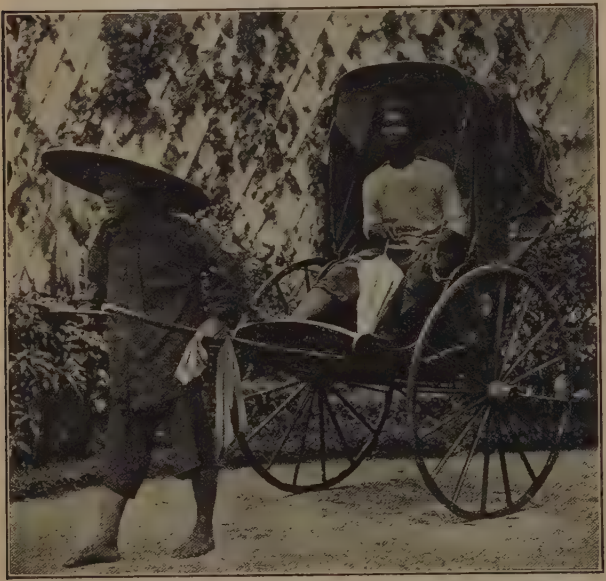


Fig. 491. — A Japanese laborer drawing a two-wheeled vehicle called a jinrikisha.

Nipon, the main island, has a warm temperate climate and abundance of rain. Other islands, near by, have a similar climate. What must be the climate of Formosa? Of the islands in the northern part of the empire?

Origin of the people and their early history

In early times, Japan was invaded by Mongolians from the mainland, who drove the original inhabitants, the Ainus, to the more barren northern islands. The Japanese are descendants of these invaders. They are small in stature, but are very strong.

The Japanese are a very artistic people. Centuries before the time of Christ, they had developed a civilization resembling that of their kinsmen, the Chinese. Their fine taste led them to manufacture many beautiful articles of silk, metal, glass, and wood.

Like the Chinese, the Japanese for a long time did not care for modern civilization, and closed their ports to the outside world. In 1853, however, United States war ships, under the command of Commodore Perry, entered Yokohama and induced the Japanese to open their ports to our commerce. After this important step the country was finally opened to the world in 1868.

The government

One great drawback to the advance of Japan was the nature of the government, which resembled the old *feudal system* of Europe in the Middle Ages. While the Mikado was emperor in name, the real power was in the hands of noblemen who had large numbers of peasants, not only to work, but to fight for them when necessary.

After the country was opened to foreigners, the power of the noblemen was lessened, and the Mikado became the real emperor. At present he is aided by two legislative bodies, one made up chiefly of noblemen, the other elected by the voters. There is also a Cabinet appointed by the Mikado, as the Cabinet of the United States is appointed by our President.

Recent advances

Since these changes, the Japanese have become noted for their ability to learn the lessons of Western civilization; and their progress has been truly marvelous. New schools have been opened, and education has been made compulsory. Americans and Europeans have been invited to Japan to teach, and Japanese students have been sent to Europe and America to study in the universities and to learn what they could of Western civilization. Thus, in a single generation, the Japanese added to their own knowledge that of Europe and America. They have learned their lessons so well that, with their patience, skill, and intelligence, they alone, of all the nations in Asia, have taken rank with the Great Powers of the world.

The progress they have made is proved by the following facts: Over two thousand newspapers and magazines are now published in Japan. While in 1872 there was only one short railway, from Yokohama to Tokyo, a distance of eighteen miles, there are now over five thousand miles of railway in the empire. The industries are also highly developed.

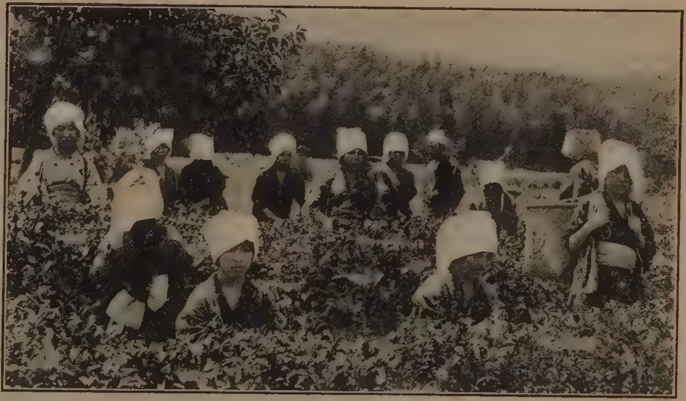


Fig. 492. — Japanese girls picking tea leaves.

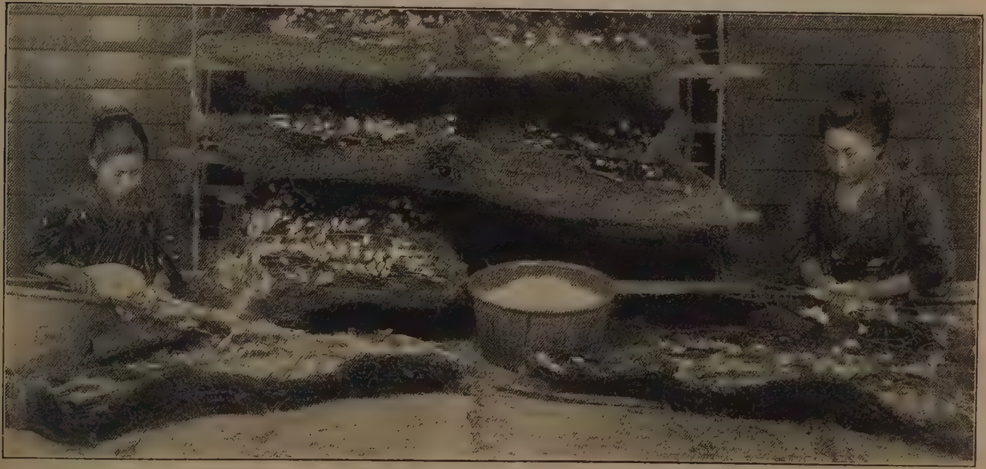


Fig. 493. — Japanese women gathering the cocoons spun by the silkworm.

Lumbering, agriculture, and fishing

The mountain sides are covered with forests of great value, including giant cedars, camphor laurels, and lacquer trees, and, wherever the soil is suited to it, there is agriculture. Among the products of the farms are wheat, sugar cane, and rice, the latter being the chief article of food, as among other Mongolians. As in China, both tea and raw silk are produced, and these form two of the main articles of export. Much of our tea comes from Japan.

Besides these industries, fully two and one half millions of people are engaged in fishing, for fish form one of the important foods of this island people.

Mining and manufacturing

Among the mountains there are valuable deposits of gold, silver, copper, sulphur, petroleum, iron, and coal, and there are now many mines.

There are many large manufactories, particularly of cotton and silk goods, pottery and machinery. As in the British Isles, cotton and raw products are imported in large quantities for manufacture. Here, too, much food must be imported, especially rice, flour, and sugar.

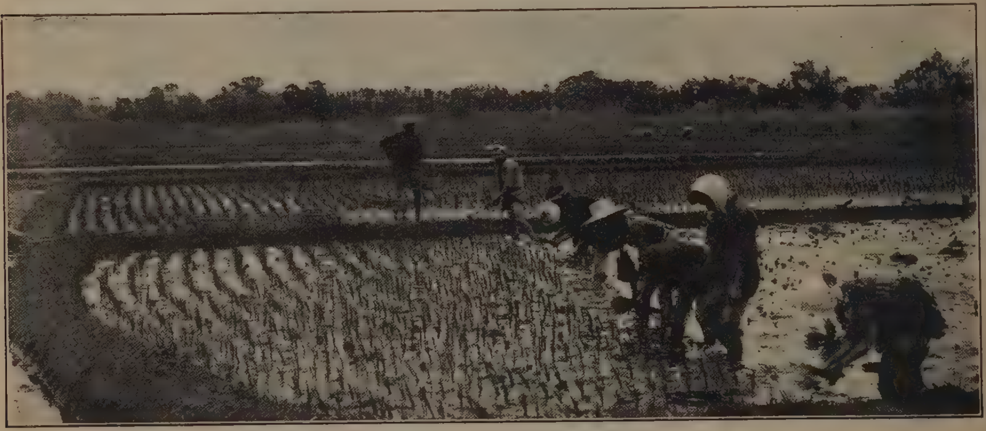


FIG. 494. — Planting rice in the flooded fields in Japan.

Principal cities

TOKYO, a city much larger than Philadelphia, and about the size of Chicago, is the capital of Japan. Besides being the home of the Mikado, and therefore having many government buildings, it is a busy manufacturing center. YOKOHAMA, at the entrance to Tokyo Bay, was a mere fishing village when visited by Perry; but since the harbor of Tokyo is unsuited for large modern ships, Yokohama has grown rapidly. It now has the largest foreign trade in Japan.

The second city in size is OSAKA, a noted cotton-manufacturing center with a population of over a million. Other important cities, having a population of several hundred thousand, are KYOTO, the former capital, and the center of the tea district, and NAGOYA, a center for porcelain manufacturing, for which Japan has long been noted.

Korea

Japan gained control of Korea in 1905, as a result of the war with Russia. This mountainous peninsula has a temperate climate, suited to the production of such crops as grains in the north, and rice, tobacco, and cotton in the south.

In many respects the Koreans resemble the Chinese; in fact, Korea was for a long time a dependency of China. While there are great natural resources, including both coal and iron, little use has been made of them. Like the Chinese, the Koreans have refused to allow foreigners to enter, as is indicated by the name "Hermit Kingdom," long applied to Korea. But since the Japanese have obtained control of the country, there has been much progress. The capital and largest city is SEOUL.

Review Questions

General Facts. 1. State the size and position of Asia. 2. Describe its surface features. 3. Its climate. 4. How do the plants and animals of northern Asia resemble those of Europe? 5. How and why do the plants and animals of southern Asia resemble those of Africa? 6. Explain our debt to Asia for domesticated plants and animals. 7. Give examples of domesticated animals in Asia. 8. What can you tell about the number of people and their distribution? 9. To what races do they belong? What is their religion? 10. State reasons for their early progress. 11. Why have they fallen so far behind? 12. What signs are there of progress in the future?

The Turkish, or Ottoman, Empire. 13. Why is this empire of special interest to us? 14. Describe its surface and climate? 15. How has its position been a disadvantage? 16. Give some facts about its industries, products, and chief cities. 17. Tell about the area, surface, and climate of the Holy Land. 18. What important events happened here? 19. What do you know about the former products and commerce of Palestine? 20. What are the present attractions here, and what are the methods of travel? 21. State some facts from the ancient history of Mesopotamia. 22. What importance has it at present?

Arabia, Persia, and Afghanistan. 23. Describe the surface features and climate of Arabia. 24. What about its former importance? 25. How is Mecca of importance? 26. Tell about the population and products of Arabia. 27. Its government. 28. Describe the surface features and climate of Persia. 29. Name its agricultural products. 30. Tell about its mining and manufacturing. 31. Its government and chief city. 32. State what facts you can about the surface, climate, and people of Afghanistan. 33. Its government and its recent importance.

Russia in Asia. 34. What are the area and principal divisions of this region? 35. Describe the principal belts of climate, and of plant and animal life. 36. Of what importance has this region been in the past? 37. Why has it not been more important? 38. What recent improvements have been made here and what are the prospects for the future? 39. Name and locate the leading cities.

The Indian Empire and Ceylon. 40. Name and locate the main divisions of this empire. 41. Describe its surface. 42. Its climate. 43. What about the density of its population? 44. To what races do the people belong? 45. Give facts about their religion and superstition. 46. How did the English get control of this region? 47. How have they been able to keep control? 48. State the principal facts about the forests and their products. 49. The farm products; the development of irrigation. 50. The danger of famines and plagues. 51. Mining and manufacturing. 52. The leading cities. 53. Tell what you can about Burma. 54. Ceylon.

Indo-China and the Malay Peninsula. 55. Describe the surface features and name the principal divisions of this region. 56. State the principal facts about Siam. 57. About French Indo-China. 58. The Straits Settlements and Malay States.

Republic of China. 59. What facts can you give about its area and population? 60. About the distribution of its population? 61. State reasons for such distribution. 62. What early advance was made by the people? 63. Describe the great wall that they built. 64. Give instances of their old-fashioned customs. 65. State reasons for such backwardness. 66. What about their government? 67. Their fishing and agriculture? 68. Mining and manufacturing? 69. Locate and tell about the leading cities.

Japanese Empire and Korea. 70. What are the parts of this empire, and how is the position of the empire important? 71. What about the area and population? 72. Describe the surface features and climate. 73. What is the origin of the people? Give facts from their early history. 74. Describe their government. 75. What about the recent advances of the Japanese? 76. Give the principal facts about lumbering, agriculture, and fishing. 77. Mining and manufacturing. 78. Principal cities. 79. Tell about Korea.

General review questions and comparisons with North America

1. How do North America and Asia differ in form? In regularity of coast line? In direction of mountain ranges? In extent of the deserts? 2. Does the Canadian Pacific Railway lie to the north or south of the Siberian railway? Which is the longer? 3. Is San Francisco north or south of Peking? 4. Name the three peninsulas of southern Asia; of southern Europe. Which of the six is nearest the latitude of Florida? 5. Name the large rivers of Asia and of Canada that flow into the Arctic Ocean. On a globe estimate the shortest distance between the mouths of the Mackenzie and Lena rivers. 6. How do the great rivers of China compare in length with the Mississippi? With the Volga? 7. How do the interior lakes and seas of Asia compare in value for commerce with our Great Lakes? Why? 8. With what salt lake in North America may the Aral Sea be compared? 9. What ocean currents affect the climate of Asia? Of North America? 10. Compare the climatic belts of Siberia with those of Canada. 11. Is western Asia more or less suited to agriculture and commerce than western North America? Why? 12. In what portions of North America and Asia is rice cultivated? 13. Answer the same question for cotton. 14. What important crops in Asia are not extensively raised in the United States? 15. Name some of the leading imports from Asia to the United States. 16. What about mining in Asia compared with that in the United States? 17. Make the same comparison for manufacturing; for railways. 18. What is the chief kind of government in each of the two continents?

Suggestions

1. What do you know about recent massacres of Armenian Christians by the Turks? 2. Make a sand or clay map of the Holy Land (Fig. 465). 3. Point out on the map (Fig. 465) some of the places often mentioned in the New Testament, and describe some of the events that occurred there. 4. What Bible events have their scene in Mesopotamia? 5. Write a paper showing how our present civilization is indebted to

the Holy Land. 6. Find out some facts about the Crusades. 7. About how far is it by rail from Lisbon in Portugal to Port Arthur on the Pacific? 8. Read Kipling's "Jungle Books." 9. Why should the Great Wall of China have less value now than formerly? 10. Find out about our laws for the exclusion of the Chinese, and the reasons why they were passed. 11. Find out about some of the events connected with the Boxer trouble in China in 1900. 12. What Asiatic countries have you seen represented among the immigrants to the United States? 13. Examine pictures of buildings in Asia (in this book or elsewhere), to note how they differ from our own. 14. Write a paper telling in what respects you would expect to find an Asiatic city different from one of your own. 15. By what water routes could you go from New York to Tientsin? Would it be nearer to go by rail as far as San Francisco or Seattle? 16. By what three all-water routes could you go from New York to Bombay? Which is the shortest? 17. Who first reached India by water? 18. Who was Marco Polo?

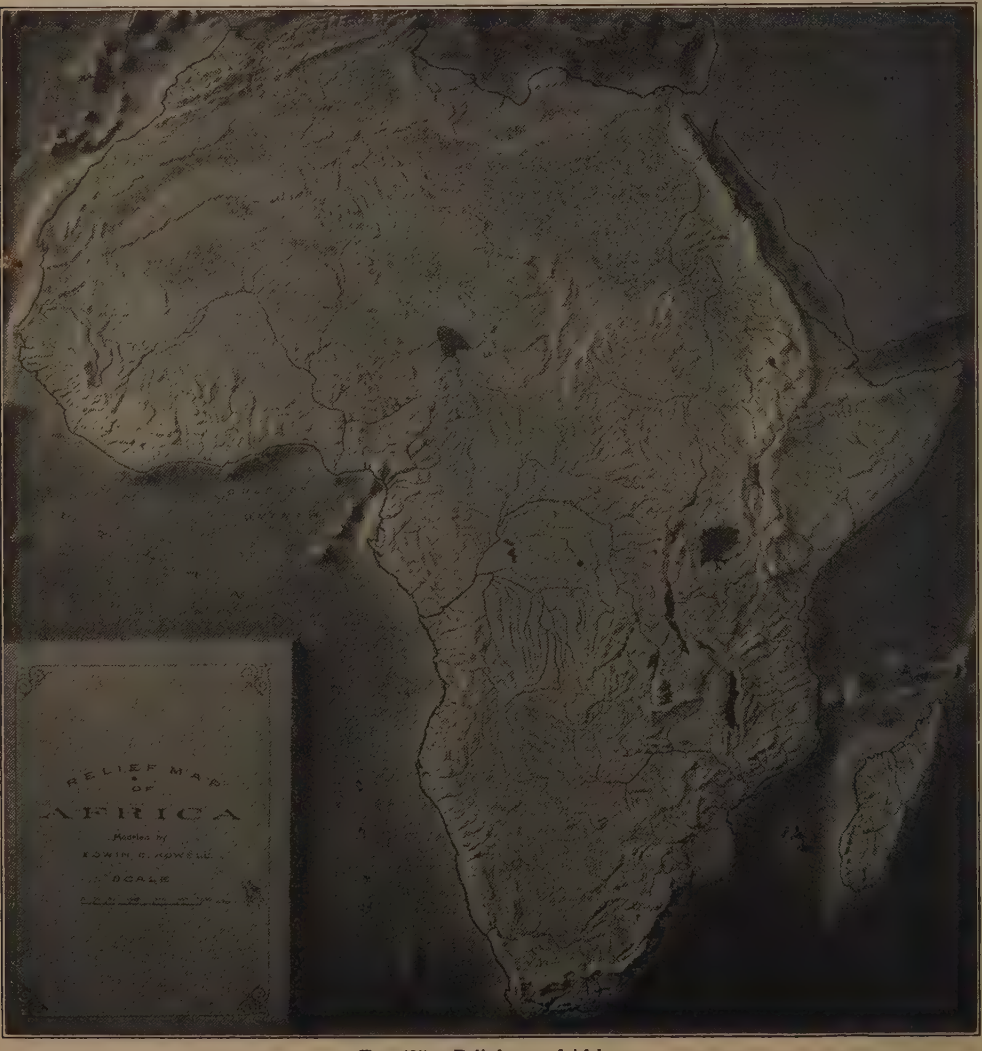


Fig. 495. — Relief map of Africa.

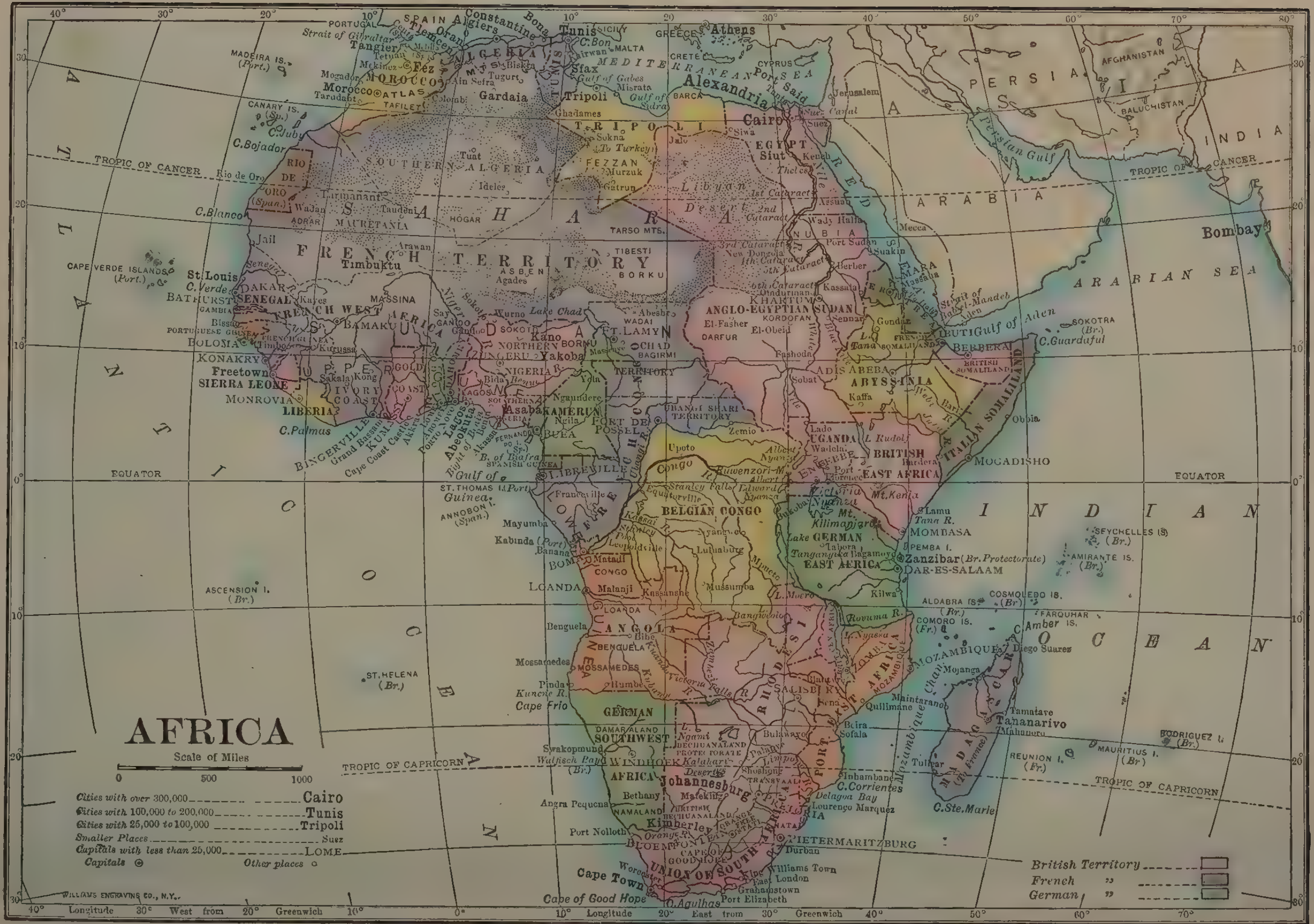

AFRICA
Scale of Miles
0
500
1000
Cities with over 300,000 Cairo
Cities with 100,000 to 200,000 Tunis
Cities with 25,000 to 100,000 Tripoli
Smaller Places Suez
Capitals with less than 25,000 LOME
Capitals ◎
Other places ○
British Territory
French "
German "
Longitude West from Greenwich
Longitude East from Greenwich
EQUATOR
TROPIC OF CANCER
TROPIC OF CAPRICORN
ATLANTIC OCEAN
INDIAN OCEAN
MEDITERRANEAN SEA
RED SEA
ARABIAN SEA
Gulf of Aden
Persian Gulf
Gulf of Guinea
ARABIA
PERSIA
INDIA
AFGHANISTAN
BALUCHISTAN
Bombay
Mecca
Jerusalem
SPAIN
PORTUGAL
GREECE
Athens
SICILY
MALTA
CRETE
CYPRUS
Strait of Gibraltar
Tangier
Fez
MOROCCO
Morocco
ATLAS
ALGERIA
Algiers
Oran
Tlemcen
Constantine
Bona
Tunis
C.Bon
Sfax
Gulf of Gabes
Tripoli
Misrata
Gulf of Sidra
BARCA
Alexandria
Port Said
Suez Canal
Cairo
EGYPT
Siut
Thebes
Nile
Assuan
Wady Halfa
NUBIA
Port Sudan
Suakin
Berber
Kassala
KHARTUM
ANGLO-EGYPTIAN SUDAN
KORDOFAN
El-Fasher
El-Obeid
DARFUR
Fashoda
ERITREA
Massaua
Strait of Bab-el-Mandeb
FRENCH SOMALILAND
JIBUTI
BERBERA
BRITISH SOMALILAND
SOKOTRA (Br.)
C.Guardafui
ITALIAN SOMALILAND
Obbia
MOGADISHO
ABYSSINIA
ADIS ABEBA
Kaffa
L.Tana
Gondar
L.Rudolf
UGANDA
Lado
BRITISH EAST AFRICA
Mt.Kenia
Lamu
Tana R.
MOMBASA
Mt. Kilimanjaro
L.Victoria Nyanza
GERMAN EAST AFRICA
Tabora
Lake Tanganyika
Bagamoyo
PEMBA I.
Zanzibar (Br. Protectorate)
DAR-ES-SALAAM
Kilwa
Rovuma R.
L.Nyassa
PORTUGUESE EAST AFRICA
MOZAMBIQUE
Quilimane
Beira
Sofala
Inhambane
C.Corrientes
Delagoa Bay
Lourenço Marquez
MADAGASCAR (Fr.)
Diego Suarez
Majunga
Tamatave
Tananarivo
Tulear
C.Ste.Marie
Mozambique Chan.
SEYCHELLES IS. (Br.)
AMIRANTE IS. (Br.)
ALDABRA IS. (Br.)
COSMOLEDO IS. (Br.)
FARQUHAR
C.Amber
COMORO IS. (Fr.)
REUNION I. (Fr.)
MAURITIUS I. (Br.)
RODRIGUEZ I. (Br.)
MADEIRA IS. (Port.)
CANARY IS. (Sp.)
C.Juby
C.Bojador
RIO DE ORO (Span.)
C.Blanco
ADRAR
MAURETANIA
CAPE VERDE ISLANDS (Port.)
St.Louis
C.Verde
DAKAR
SENEGAL
BATHURST
GAMBIA
PORTUGUESE GUINEA
Bissao
BOLOMA
FRENCH GUINEA
KONAKRY
Freetown
SIERRA LEONE
MONROVIA
LIBERIA
C.Palmas
IVORY COAST
BINGERVILLE
Grand Bassam
KUMASI
GOLD COAST
Cape Coast Castle
Akkra
TOGO
LOME
DAHOMEY
Porto Novo
Lagos
Abeokuta
NIGERIA
Bida
Benue R.
SOUTHERN NIGERIA
NORTHERN NIGERIA
Asaba
Kano
SOKOTO
ZUNGERU
Yakoba
Bight of Benin
B. of Biafra
FERNANDO PO I. (Sp.)
SPANISH GUINEA
KAMERUN
BUEA
Ngaundere
Yola
FRENCH WEST AFRICA
Timbuktu
MASSINA
BAMAKU
Kayes
Niger
Say
Zinder
Lake Chad
FT.LAMY
CHAD
BAGIRMI
BORNU
WADAI
Abesher
TIBESTI
BORKU
TARSO MTS.
ASBEN
Agades
SAHARA
FRENCH TERRITORY
SOUTHERN ALGERIA
Tuat
Ideles
HOGAR
Taudeni
Arawan
Gardaia
Biskra
Tugurt
Ghadames
TRIPOLI (To Turkey)
Sokna
FEZZAN
Murzuk
Gatrun
Libyan Desert
Siwa
Jalo
UBANGI SHARI TERRITORY
FORT DE POSSEL
FRENCH EQUATORIAL AFRICA
LIBREVILLE
Franceville
Ubangi R.
Congo R.
Upoto
Zemio
Stanley Falls
Ruwenzori Mt.
L.Albert
L.Edward
BELGIAN CONGO
Kassai R.
Leopoldville
Lualaba
Nyangwe
L.Moero
Mussumba
BOMA
Matadi
Banana
Kabinda (Port.)
Mayumba
ST.THOMAS I. (Port.)
ANNOBON I. (Span.)
LOANDA
Malanji
Kassanshe
ANGOLA
Bihe
Benguela
BENGUELA
Mossamedes
MOSSAMEDES
Humbe
Kuando R.
Pinda
Kunene R.
Cape Frio
Zambezi R.
Victoria Falls
RHODESIA
Bangweolo
SALISBURY
Bulawayo
Tete
BECHUANALAND PROTECTORATE
L.Ngami
Kalahari Desert
GERMAN SOUTHWEST AFRICA
DAMARALAND
NAMALAND
Swakopmund
Walfisch Bay (Br.)
WINDHOEK
Bethany
Angra Pequena
Port Nolloth
Orange R.
Limpopo R.
TRANSVAAL
Johannesburg
PRETORIA
Mafeking
Kimberley
ORANGE FREE STATE
BLOEMFONTEIN
NATAL
PIETERMARITZBURG
Durban
UNION OF SOUTH AFRICA
CAPE OF GOOD HOPE
Cape Town
Worcester
Cape of Good Hope
C.Agulhas
Port Elizabeth
Grahamstown
East London
King Williams Town
ST.HELENA (Br.)
ASCENSION I. (Br.)
WILLIAMS ENGRAVING CO., N.Y.

FIG. 496.

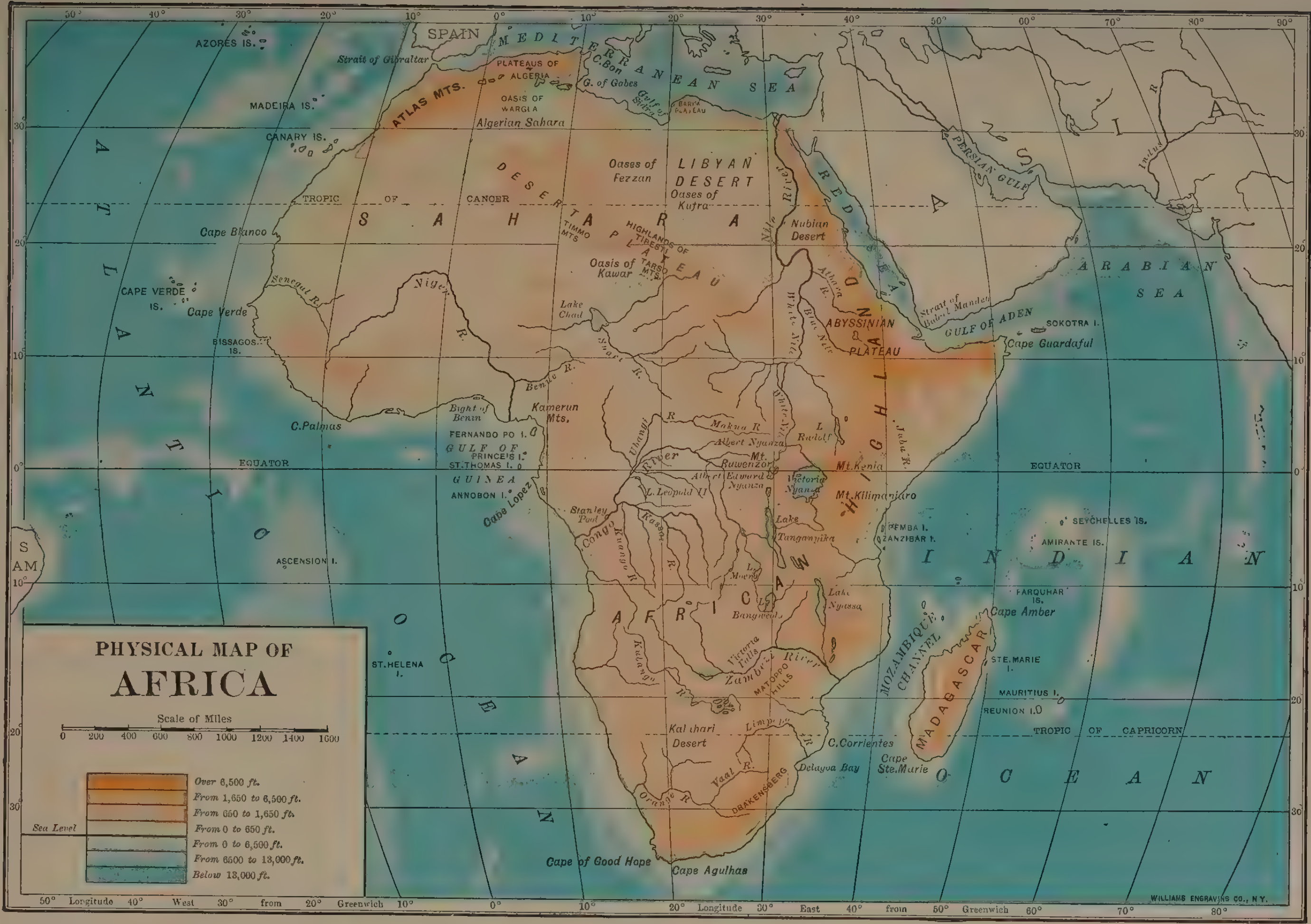

PHYSICAL MAP OF
AFRICA
Scale of Miles
0 200 400 600 800 1000 1200 1400 1600
Over 6,500 ft.
From 1,650 to 6,500 ft.
From 650 to 1,650 ft.
From 0 to 650 ft.
Sea Level
From 0 to 6,500 ft.
From 6500 to 13,000 ft.
Below 13,000 ft.
SPAIN
MEDITERRANEAN SEA
AZORES IS.
Strait of Gibraltar
MADEIRA IS.
CANARY IS.
ATLAS MTS.
PLATEAUS OF ALGERIA
OASIS OF WARGLA
Algerian Sahara
C.Bon
G. of Gabes
Gulf of Sidra
BARKA PLATEAU
Oases of Fezzan
LIBYAN DESERT
Oases of Kufra
DESERT PLATEAU
SAHARA
TROPIC OF CANCER
TIMMO MTS
HIGHLANDS OF TIBESTI
TARSO MTS.
Oasis of Kawar
Cape Blanco
CAPE VERDE IS.
Cape Verde
Senegal R.
BISSAGOS IS.
Niger R.
Lake Chad
Shari R.
Benue R.
Bight of Benin
Kamerun Mts.
C.Palmas
FERNANDO PO I.
GULF OF GUINEA
PRINCE'S I.
ST.THOMAS I.
ANNOBON I.
Cape Lopez
EQUATOR
Ubangi R.
Makua R.
Albert Nyanza
Mt. Ruwenzori
Albert Edward Nyanza
L. Leopold II
Victoria Nyanza
River
Stanley Pool
Congo
Kuango R.
Kassai
R.
Lake Tanganyika
L. Moero
Bangweolo
Lake Nyassa
AFRICA
Kubango
Victoria Falls
Zambezi River
MATOPPO HILLS
Kalahari Desert
Limpopo R.
Vaal R.
Orange R.
DRAKENSBERG
Cape of Good Hope
Cape Agulhas
C.Corrientes
Delagoa Bay
Cape Ste.Marie
MOZAMBIQUE CHANNEL
MADAGASCAR
Cape Amber
STE.MARIE I.
MAURITIUS I.
REUNION I.
TROPIC OF CAPRICORN
FARQUHAR IS.
SEYCHELLES IS.
AMIRANTE IS.
PEMBA I.
ZANZIBAR I.
Mt.Kilimanjaro
Mt.Kenia
Juba R.
L. Rudolf
White Nile
Blue Nile
Atbara R.
ABYSSINIAN PLATEAU
HIGHLANDS
Nile River
Nubian Desert
RED SEA
Strait of Babel Mandeb
GULF OF ADEN
SOKOTRA I.
Cape Guardaful
ARABIA
PERSIAN GULF
ARABIAN SEA
ASIA
Indus R.
INDIAN OCEAN
ATLANTIC OCEAN
ASCENSION I.
ST.HELENA I.
S. AM.
Longitude West from Greenwich
Longitude East from Greenwich
50° 40° 30° 20° 10° 0° 10° 20° 30° 40° 50° 60° 70° 80° 90°
30 20 10 0 10 20 30
WILLIAMS ENGRAVING CO., N.Y.

FIG. 497.

II. AFRICA

Map Study

1. Compare Africa with the other continents in size (Fig. 1). 2. Sketch the outline of Africa, and locate the principal rivers and lakes. 3. What peculiar fact do you notice about the location of the mountains? 4. What zones cross Africa? 5. What kind of climate would you expect to find (*a*) in the extreme north; (*b*) in the extreme south; (*c*) at the equator; (*d*) near the tropics? 6. Find the desert country north and south of the equator (Fig. 497). 7. In what sections are most railways found? What reasons can you suggest for their location? 8. Where are the large cities? Compare their number with those in other continents.

1. General Facts

Surface features

1. Shape of the continent

Africa, the second continent in size, resembles South America in outline. Its form is roughly that of a triangle, broad at the north and tapering toward the south. The coast line is very regular, in this respect being quite different from the coast of Europe, Asia, and North America, but resembling that of South America and Australia. What effect must such a regular coast have on the number of harbors? What gulfs, seas, and large islands are found on the map of Africa?

2. The mountains and plateaus

Africa differs from all other continents in its mountain systems. The continent is mainly a plateau; but near the coast the plateau edges are broken, and the rocks uplifted, so that there is an almost complete mountain rim (Fig. 498). Trace the mountain rim (Fig. 495); from what part of the coast is it absent? In northern Africa some of the peaks of the Atlas ranges rise to a height of fourteen thousand feet; but the loftiest mountains are in the east central part. Among the latter is the volcanic cone of Kilimanjaro. Find this peak and trace the mountains from there northward. Notice the elevated land in Abyssinia.

3. The drainage

Owing to the mountain rim, the rivers of Africa are peculiar. For instance, the Niger, after rising among the highlands near the west coast, sweeps around in a great curve before entering the Atlantic. The Zambezi, in the south, also rises near the west coast, but flows eastward across the continent to the Indian Ocean. Trace the courses of the Nile and the Congo, the two largest rivers.

In descending from the interior plateau each of these streams is interrupted by rapids and falls. Find the Victoria Falls of the Zambezi (Fig. 497); the cataracts of the Nile; also Leopoldville on the Congo, below which are some falls. How must these great rivers compare, therefore, with the Mississippi or Amazon as routes for commerce? How must these falls affect the development of Africa?

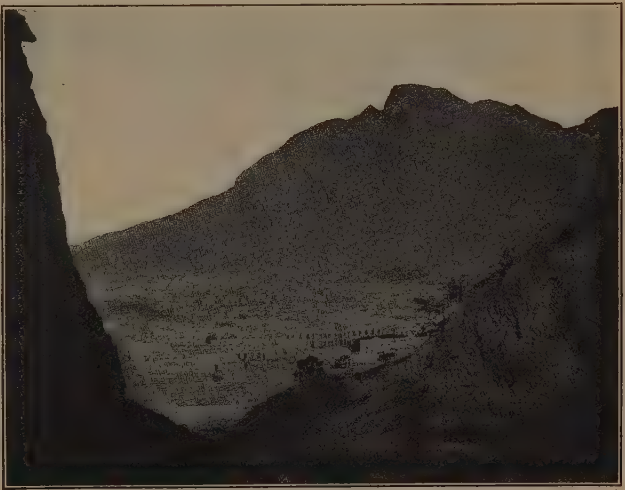


FIG. 498. — The mountainous rim of the African plateau at Cape Town.

In one part of Africa there are several

4. The lakes

large lakes. Name the three largest. Into what rivers do they empty? How do they compare in size with our Great Lakes (Appendix, p. 431)? Why are they not as useful for navigation and commerce?

Climate

1. Its general character

The equator crosses so near the middle of Africa that only the northern and southern extremities are in the temperate zones. Therefore the climate of most of the continent, like that of South America, is tropical.

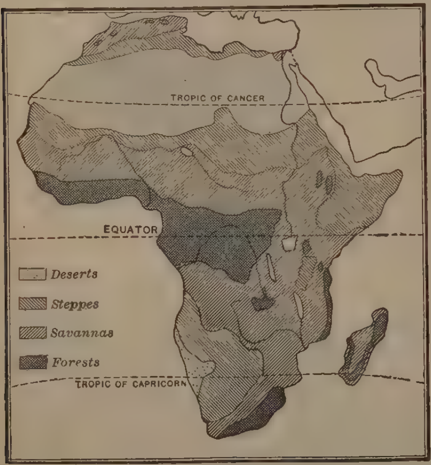


Fig. 499. — To show the influence of climate on vegetation. In the savanna area there are numerous forest-covered sections, especially near the rivers.

Since the African plateau rises to nearly the same elevation in all parts, the belts of climate extend nearly east and west. Is this true of South America?

2. The forest belt

For some distance both to the north and south of the equator, there is such a hot, rainy climate that, as in the Amazon Valley, the land is covered with a dense tropical forest. This is especially true near the coast at the base of the plateau, where the narrow strip of coastal plain is hot, reeking with moisture, and is therefore the seat of deadly malaria.

The interior, owing to its greater elevation, is cooler and more healthful; but even there tropical heat and rain prevail near the equator. It is this heavy rainfall that supplies the Congo and Nile with their immense volumes of water.

3. The savannas north and south of this belt

Both north and south of the rainy region is the savanna belt (Fig. 499), where the rainfall varies with the season. Why (p. 214)? Where are the corresponding savannas in South America (p. 238)? Why are the savanna belts covered with grass instead of forests (p. 228)?

The small number of streams on the map (Fig. 497) shows how dry the climate must be in the savanna belts. So, also, does the condition of Lake Chad; for, although a good-sized stream enters this lake, no water flows out. The size of this lake is not always the same, for during the dry season the lake shrinks until it is smaller than Lake Erie, but with the coming of the wet season it rises until it becomes several times as large.

4. The two desert regions

(1) Their location

As the tropical forest grades into the savanna, so the savanna merges into the true desert (p. 377), where the influence of the drying trade winds is felt at *all* times of the year. In only a few parts of northern and southern Africa is there a fair amount of rain; that is on the mountain slopes near the Mediterranean (Fig. 298) and on the southeastern slopes of South Africa, where the winds blow from the sea.

(2) Why the northern desert is much the larger

The northern desert is much larger than that south of the equator. This is due partly to the fact that the continent is so broad in the north, and partly to the large land areas which lie to the north and east. Since the north and east are the directions from which the winds of northern Africa must come, they reach this region with little vapor. Thus the Sahara forms a part of the most extensive desert belt in the world.

In the Sahara there are cloudless skies, and there is very little rain; but here and there, on the moun-

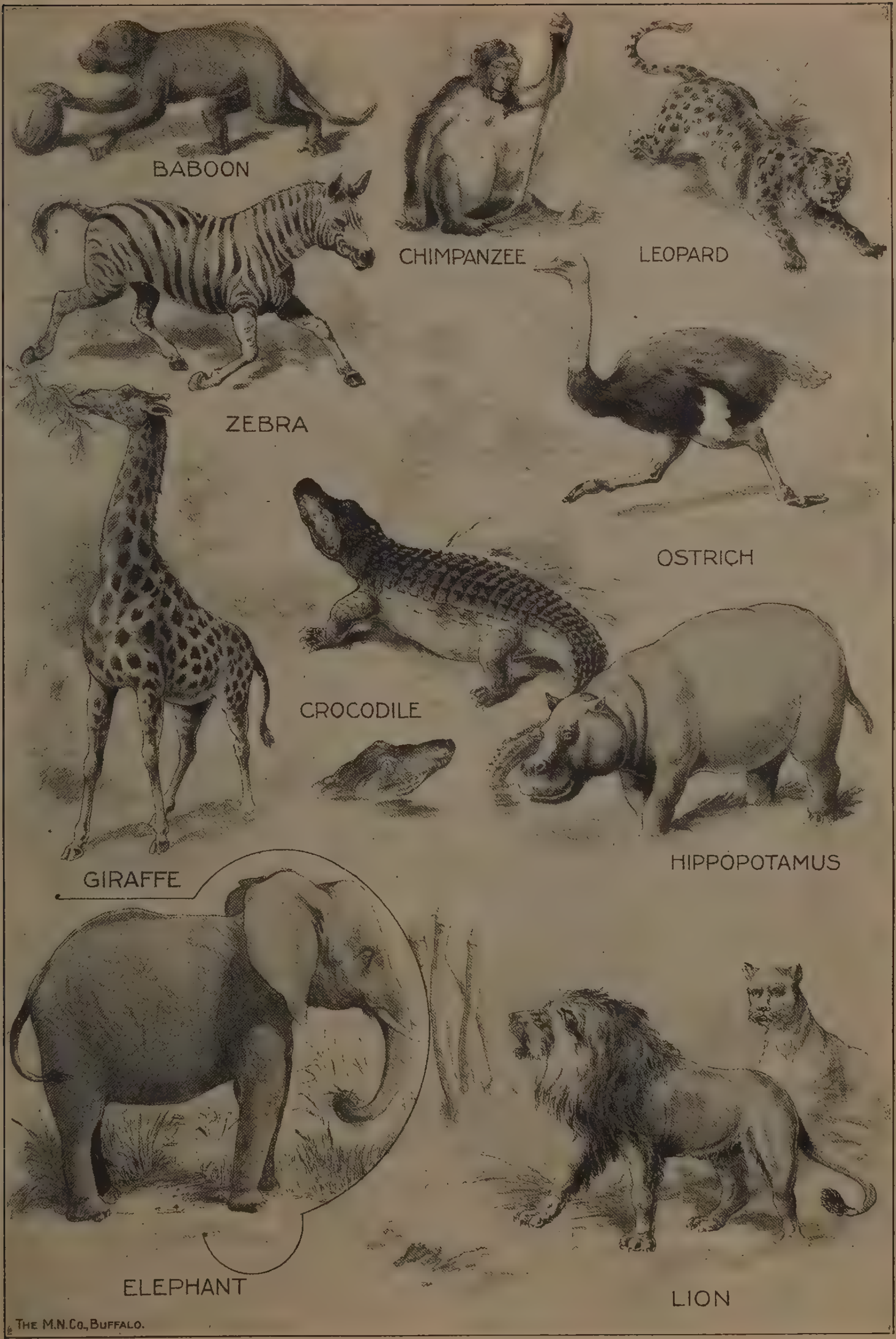


Fig. 500. — Some of the wild animals of Africa.

(3) ***The kind of climate in the Sahara***

tain slopes, there is moderate rainfall. It is this which supplies the widely scattered springs, and the short mountain streams that nourish the vegetation of the oases. In the dry, clear desert air, the nights are cool, even in summer. Although the midday temperature may rise as high as 100°, or even 115°, in the shade, blankets are needed for cover at night.

The native plant and animal life

1. In the savannas and the forest belt

The open country between the desert and the tropical forest abounds in large animals (Fig. 500). Among these, on the savannas, and on the edge of the forest, are the antelope, giraffe, buffalo, zebra, elephant, lion, leopard, and rhinoceros, while the crocodile and the huge hippopotamus live in the rivers. The dense forest itself is shunned by many of the larger animals, though teeming with insect life, birds, reptiles, and tree-dwelling mammals. Among the latter are the baboon, the gorilla, and the chimpanzee (Fig. 500).

FIG. 501. — An African negro woman planting.

2. In the desert regions

Portions of the desert, especially where covered with dunes of moving sand, have almost no plant life. Animals are also few in number, among them being the ostrich (Fig. 500) and the camel. The oases, on the other hand, support a number of plants. Of these the date palm is most notable, for it is an important source of food for the nomads of the desert.

Native inhabitants of Africa

1. Negroes

Central and southern Africa is the home of the negroes, who are divided into many tribes with different customs. For centuries the negroes were captured by the whites and sold into slavery; but the day of the slave trade is now almost past.

In spite of the frequent slave-hunting raids, and the great destruction of life in the fierce tribal wars, there are many negroes left. Some are fierce and warlike; others peaceful. Those who dwell in the forest live by hunting; those upon the savannas, by simple forms of agriculture (Fig. 501) and by herding. With a fertile soil, and in a warm climate, they are able to support themselves with little work, especially along the rivers and on the savannas.

2. Whites

The forest and much of the savanna have been occupied by the negro, even down to the present day; but the arid sections of northern Africa have been held by the white race since very early times. They are in part herders, living the nomadic life common to such lands. These people are intelligent and full of energy, though fierce and warlike. On the oases are a more peaceful class, living the life of farmers. Near the border line between the blacks and whites there has been such a mixture of blood that the population consists largely of half-breeds.

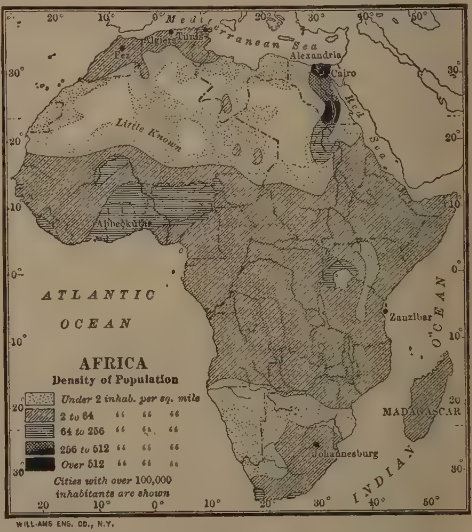


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FIG. 502.

Exploration and settlement

1. Why so little of either

Although Africa is so near Europe, it has been less explored and settled by Europeans than any other continent.

There are several reasons for this, the most important being the fact that so much of Africa has a tropical climate. The desert repels people, and the hot, damp climate of the coastal strip, upon which colonies would naturally be first started, was found to be very unhealthful (p. 374). Disease is apt to seize white men even while they are crossing the coastal strip. Besides, progress into the interior was checked by hostile hordes of blacks, and by the absence of navigable rivers. Moreover, men who were willing to leave Europe were more attracted toward Australia and America. Why?

2. Exploration and settlements by the Portuguese

Even before the famous voyage of Columbus, the Portuguese — the most progressive sailors of that day — were trying to reach the East Indies by sailing around the southern end of Africa. After various voyages, the Cape of Good Hope was finally passed, and in 1498 the way to the Indies by water was opened. The Portuguese made settlements on the east and west coasts of Africa, and they still have large colonies there (Fig. 496).

3. By the Dutch

By far the most successful colony in the newly discovered parts of Africa was that started by the Dutch at Cape Colony, a little later than their settlement of New York. As was the case in New York, the British seized the Dutch territory; but by migrating northward, the Dutch were able to remain independent for a long time. Finally, in 1900, that territory also was seized by the British, who still hold it.

4. By other people

During the nineteenth century, Livingstone, Stanley, and other explorers entered the "dark continent"; and since these expeditions there has been great progress in exploring Africa. Many European nations have taken part in the exploration, and as a result have laid claim to the territory. Among these the British have been by far the most active. What other nations have possessions in Africa (Fig. 496)?

2. Northern Africa

Divisions of this region, and their government

Much of northern Africa is such a desert that its inhabitants are few and scattered. It is, however, under the control of several nations. The greater part of the Sahara is claimed by the French, though the Spanish hold a small section on the western coast, and the British control both the Libyan desert and the Egyptian Sudan in the east.

Along the Mediterranean coast are several well-settled sections, the best known being Egypt. The four countries west of Egypt — Tripoli, Tunis, Algeria, and Morocco — are often called the *Barbary States* (the home of the Berbers). Tripoli and Egypt are parts of the Turkish Empire, although the latter is partly under the control of the English; Algeria and Tunis belong to France; and Morocco is independent. It is ruled by an absolute monarch, called the Sultan.

The Sahara

1. Its extent

From the Atlantic to the Red Sea, and from near the Mediterranean coast to the grass lands of the Sudan, there is almost unbroken desert — the famous Sahara. Its area is estimated to be from three to four million square miles, or about equal to that of the entire United States.

2. Its surface features

It is a plateau of uneven surface, with low mountain ranges here and there, and bordered on the north by the Atlas Mountains. The windswept highlands are bare and stony, while in the lowlands there are extensive areas of sand dunes. Much of the soil is fertile, and with rainfall would yield abundant crops. But nature has forbidden rain, and its surface is therefore barren in the extreme. Only on the oases, of which there are some four hundred in the Sahara, is there water for irrigation and for drinking (Fig. 503).

Caravans cross this desert in order to carry the products of central Africa to the northern coast. These include ivory, skins, and ostrich feathers, obtained by bartering with the negroes.

3. Caravans

(1) *Their object*

(2) *How they are conducted*

One of the important routes is from Tafilet in Morocco, southward to Timbuktu, and the trip requires fully three months. Estimate the distance. There may be from a thousand to fifteen hundred camels in a single caravan, and a full year may be needed to equip it. Each camel is carefully selected by the chief of the caravan, and extra camels are taken to replace those that give out on the journey. Usually about a third of the animals perish in the round trip; and before the return journey is begun, it is necessary for those that have survived to have a rest of several weeks.

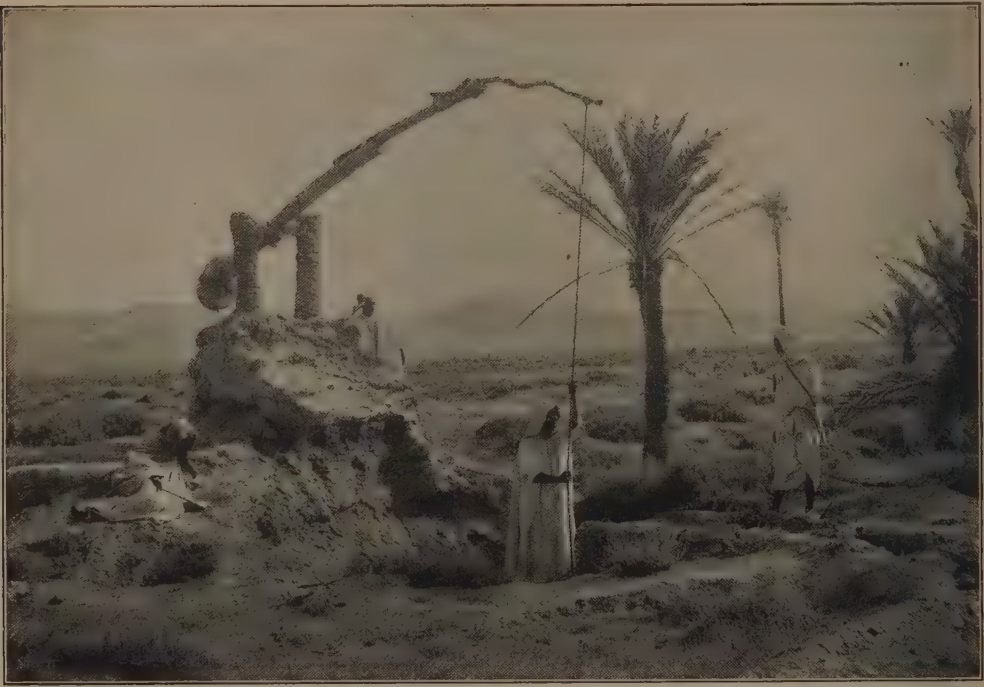

Fig. 503. — Algerian natives drawing water from a well on the edge of an oasis in the Sahara desert.

There is one driver for every dozen camels. Upon starting, the loads are carefully packed on the camels' backs, each animal bearing about three hundred pounds. A day's march lasts sixteen hours, the camels traveling some thirty abreast, at the rate of about two miles an hour. Ordinary camels cannot travel more than three days without drinking; but the better grades are able to go six or seven days without water, and with almost no food.

(3) *The dangers*

There are dangers in the journey aside from that of thirst. Sometimes sand storms arise; and although such a storm may not last many hours, it may destroy a whole caravan. The wind then blows fiercely, and sand fills the air, drifting about in such quantities that animals and men alike are smothered in the drifts. Small caravans are in danger of being attacked by wandering tribes; and near the southern edge of the desert the danger from attack by the lion is added. It requires courage and great powers of endurance to engage in the caravan trade.

Egypt and neighboring British territory

1. Its climate

Egypt and the Libyan desert are a continuation of the Sahara, and have all the features of the desert just described. Even at Cairo the average yearly rainfall is but an inch and a half. The climate of northern Egypt, both in summer and winter, closely resembles that of the desert portion of western Arizona and southeastern California.

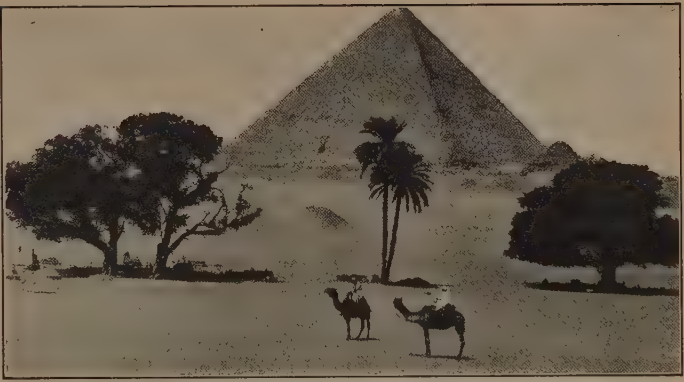

Fig. 504. — One of the Pyramids.

2. The Nile River

(1) *Where its waters come from*

The Egyptian Sudan and the country south of it, on the other hand, have a tropical climate, arid in the north, but warm and humid in the south, where the influence of the tropical rains is felt. The head waters of the Nile, near the equator, are fed by such heavy rains that the river is able to flow across the desert in spite of the fact that no tributaries enter the lower half of its course. How great a distance is that?

(2) *Its character*

After leaving the rainy region of the south, the Nile crosses the desert through a valley — in places a thousand feet deep — which it has cut in the plateau. In this part of its course there are several cataracts (Fig. 496).

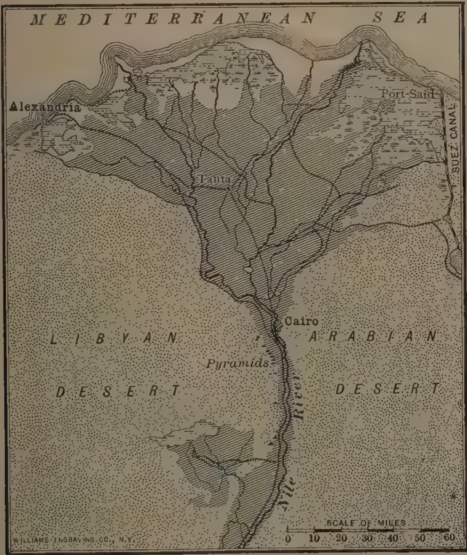

Fig. 505. — The lower Nile. The shaded area between the two deserts is farming land, which is reached by water from the river. The numerous crossed lines are railways. Find the Pyramids. Why is the location at the head of a fertile delta, and at the outlet of a narrow river valley bounded by desert, a favorable one for a large city?

Below Cairo the river leaves its narrow valley, divides into several channels, and flows across a plain (Fig. 505). This plain is the *delta* which the Nile has built in the Mediterranean Sea during the ages that the river has been bringing sediment from its upper course. It is the Nile that suggested the term *delta*, now given to similar deposits at the mouths of rivers in various parts of the world. The word comes from the Greek letter delta (Δ), which has the form of a triangle. Notice that shape in Figure 505.

(3) *Its importance*

When the rainy season swells the Nile tributaries among the Abyssinian Mountains, the river rises so high that it overflows large tracts of the broad delta below Cairo. The rise begins in June and reaches its height in October. By this overflow the land is irrigated, and a thin layer of fine mud is spread over the fields. This serves to fertilize the soil so that, year after year, heavy crops may be raised without making the soil sterile.

Without the Nile the whole of northern Egypt would be a sparsely inhabited desert; but the precious river waters transform the section near the Mediterranean into a great oasis. This has become the

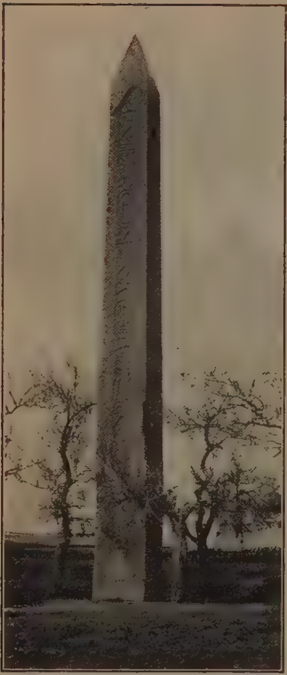

Fig. 506. — An obelisk in Egypt.

seat of an important agricultural industry, and is densely settled.

3. Agriculture

Because of these very favorable conditions, the Nile delta has been occupied by an agricultural people from the very earliest times. It is still the seat of a great grain industry, producing wheat, corn, millet, and barley. Much rice and sugar cane are also raised, and much cotton, which is of especial value because of its long fiber. There are many vineyards, and orange, lemon, and fig groves; and both along the Nile and on the oases of the desert there are groves of date palms. Grazing is important in the Nile Valley and on the neighboring plateau. The animals raised include the buffalo and camel, in addition to sheep, goats, cattle, horses, and donkeys.

4. History

(1) *Its prosperity in ancient times*

The known history of Egypt reaches back several thousand years before the time of Christ. The fertile soil and favorable climate encouraged agriculture then, as now; and the surrounding desert and sea gave protection from frequent invasions. This led to the growth of a prosperous nation, in which there arose a civilization in advance of that of the neighboring sections of Europe and Asia. In fact, at the time when Europe was inhabited by barbarians, Egypt had made long advances in civilization. It was from Egypt that Europeans learned some of their early lessons.

We read in the Bible of the Pharaohs who ruled over Egypt. Can you recall any of the Bible stories which mention these rulers; for example, the story of Joseph? During those times the Egyptians built the obelisks (Fig. 506), the Sphinx (Fig. 507), and the marvelous pyramids (Fig. 504) which are really the tombs of kings. By a peculiar process they preserved the bodies of their dead, and these *mummies* may be seen in the museums in many of our large cities. Among the mummies that have been found are the remains of some of the Pharaohs themselves.

(2) *How it later suffered*

Egypt later became one of the highways of the world, when the people who dwelt along the eastern shores of the Mediterranean, and farther east in Asia, began to migrate westward. Against its people many destructive wars were waged, and as other nations have advanced, the Egyptians have steadily lost ground. The famous conqueror, Alexander the Great, overcame the Egyptians and founded the city of Alexandria; later

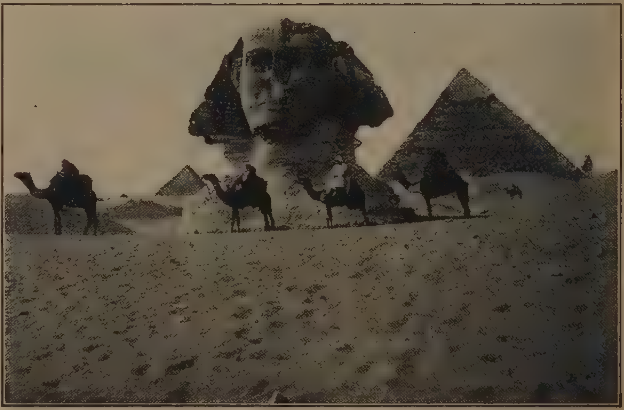

Fig. 507. — The Sphinx in the Egyptian desert.

the Romans made conquest of the territory; and since then it has been repeatedly invaded, for it has continued to be a highway of trade for three continents. Among the last conquerors of Egypt were the Mohammedan Turks, and for a long time Turkey has had some control over the country. At present Egypt is required to pay annual tribute to Turkey; but it is otherwise independent of that country.

(3) *How it came partly under control of the English, and the results*

The government of Egypt is a monarchy, and the ruler is called the *Khedive.* Egypt was governed so badly that the French and British finally took control of the finances of the nation. When the French refused to aid in subduing a rebellion in Egypt, the British alone took a large share in the control of Egyptian affairs.

As a result of British direction, there has recently been much progress in Egypt. Extensive irrigation works have been undertaken, by which the area suitable for raising cotton and sugar cane has been greatly increased. By means of reservoirs and canals it is further planned to reclaim thousands of square miles of the desert. Several railway lines have also been built (Fig. 496), including a part of a proposed line from Cairo to Cape Town, as far as Khartum. Outside of the Nile Valley, however, travel still depends largely upon the use of camels (Fig. 507).

5. The Suez Canal

Northeastern Egypt includes the Isthmus of Suez, which connects Africa with Asia. This narrow neck of land has for centuries stood as a barrier to water travel from Europe to southeastern Asia, forcing European vessels to pass all the way around Africa in order to reach southern Asia. It is not to be wondered at, therefore, that a ship canal has been dug across this isthmus.

The Suez Canal, begun in 1859, was finished in 1869. It extends from SUEZ to PORT SAID (Fig. 508), and is eighty-seven miles long, with a depth of twenty-six feet and a width at the surface of from sixty-five to one hundred and twenty yards. Its length is much greater than that of the Panama Canal, but it was easier to dig, for the country is quite level, and about twenty-one miles of the canal is through a lake. Ten vessels, on an average, pass through the Suez Canal each day. Estimate the distance saved by this canal in going from London to Calcutta.

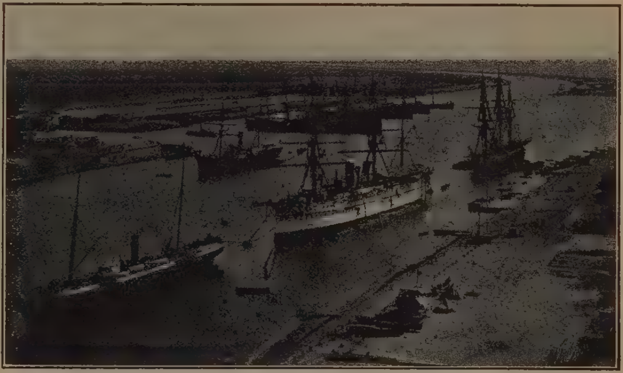

FIG. 508. — Ships passing through the Suez Canal.

6. Leading Cities

At the head of the delta, just above the point where the Nile branches (Fig. 505), is CAIRO, the capital and largest city of Egypt and, in fact, of all Africa. It has a population of over half a million. This interesting place is visited each year by a stream of tourists, some attracted by its reputation as a winter health resort, others by the strange life of the country and by the remarkable ruins of the ancient civilization (Figs. 504, 506, and 507).

Cairo itself contains the palace of the Khedive, several interesting mosques, and a museum in which there are many Egyptian relics and works of art. The natives also attract attention, for in the streets may be seen many people, with different languages and peculiar customs (Fig. 509). The differences among the people are indicated by the following fact: There are three Sabbaths each week, Friday, the Sabbath of the Mohammedans; Saturday, observed by the Jews; and Sunday, by the Christians.

ALEXANDRIA, connected with Cairo by rail, is the seaport of Egypt and the second city in size. Nearly half the trade is with Great Britain.

The Barbary States

1. Their surface and climate

State the position of each of the four countries west of Egypt. While these countries border the Mediterranean, they extend far southward into the desert (p. 377). What about the government of each?

The Atlas Mountains skirt the Mediterranean coast from the Atlantic to Tunis, where they project into the Mediterranean, forming the most northerly point in Africa. These mountains cause vapor to be condensed when winds blow from the ocean or from the Mediterranean. For this reason many of the valleys among the mountains are well watered.

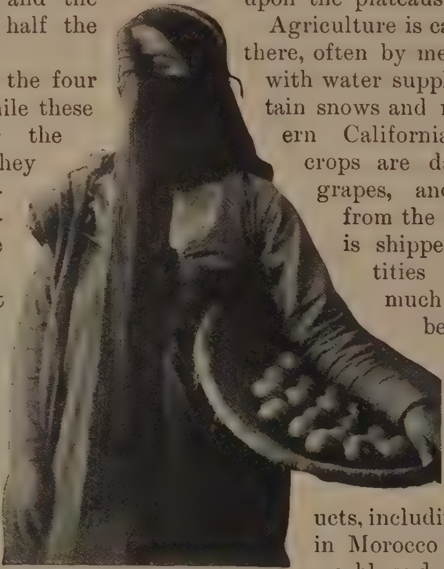

FIG. 509. — An Arab woman in the streets of Cairo.

2. Their products

Forests cover some of the mountain slopes, and one of the valuable trees is the cork oak. Large numbers of camels, sheep, goats, and cattle are raised among the mountains and upon the plateaus.

Agriculture is carried on here and there, often by means of irrigation, with water supplied by the mountain snows and rains, as in southern California. Among the crops are dates, grains, figs, grapes, and olives. Wine from the grapes of Algeria is shipped in large quantities to France; and much olive oil and the best dates in the world come from Tunis.

The mountains contain many valuable mineral products, including precious metals in Morocco and Algeria, and marble and alabaster in the latter country. Little use is made of these minerals, however.

The original occupants of this region, the *Berbers*, still dwell on the desert and

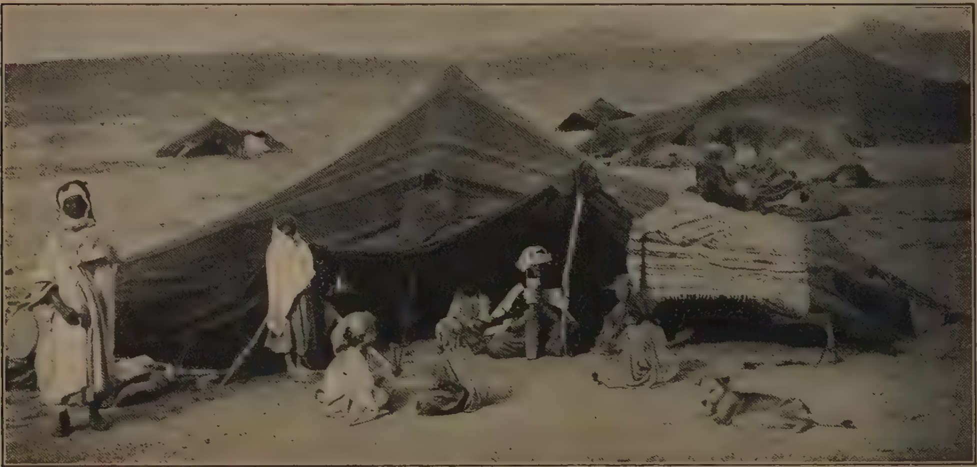

FIG. 510. — Nomads encamped in the desert of Algeria, south of Biskra.

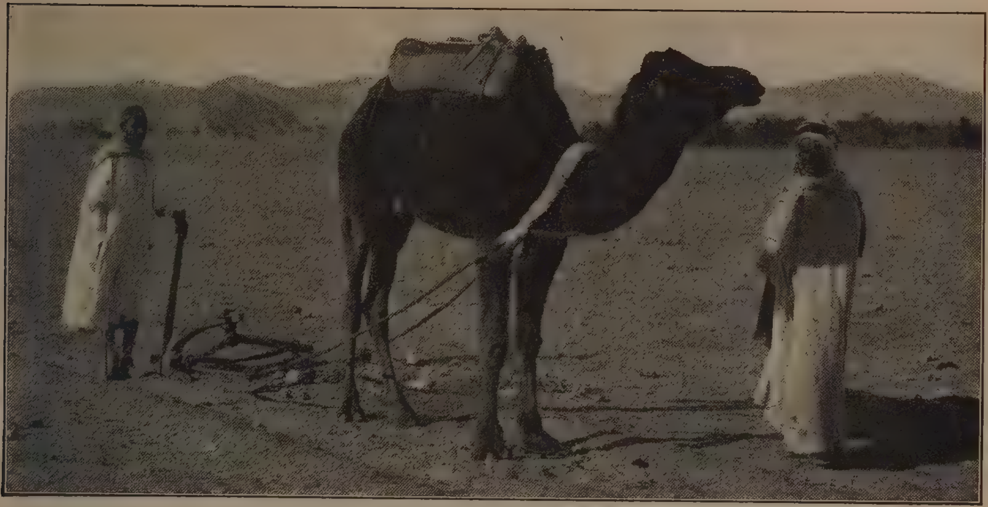

Fig. 511. — Algerian natives plowing with a camel on an oasis in the desert.

3. Character of the inhabitants

among the mountains, where they were driven long ago by invading Arabs. Most of the natives are Mohammedans.

Many of the inhabitants of Morocco are still barbarians, and some of the tribes among the mountains even refuse to recognize the rule of the Sultan. On the whole the people are cruel and treacherous, and if a vessel is wrecked upon their coast, it is sure to be plundered by them. Even within the last few years, Europeans have been seized and held for ransom. It is easy to see, therefore, why it has been necessary for Spain, with the consent of other Powers, to attempt to control these wild people.

Conditions of life in Morocco are illustrated by the following: The writer once visited a school in Tangier consisting of a dozen boys from nine to ten years of age. The room where they studied received its only light from the open door, and it contained no seats, desks, or furniture of any kind. The children sat on the floor, in a semicircle around a long-bearded old man, who also sat on the floor; and the only object that each had before him was a page from the Koran, or Mohammedan Bible. What does such a condi-

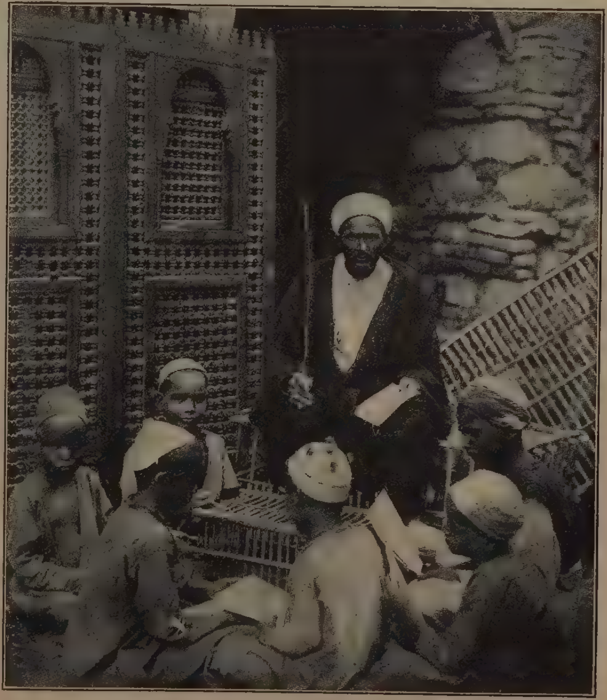

Fig. 512. — An Arab school in northern Africa.

tion of education suggest in regard to progress? If this is the case on the coast, almost within the shadow of Europe, what must be the condition farther inland?

4. Principal cities

The capitals are the principal cities among the Barbary States. FEZ, one of the capitals of Morocco, is in the interior; but the Sultan and his court do not reside there all the year. Name the other capital. TANGIER, on the coast, is better known. Why should it be? In Algeria, the seaport ALGIERS is the capital and largest city. It is an interesting place, having both ancient and modern buildings side by side. Under the French it has become an important trading center. The same is true of TUNIS, the capital of the country by that name. Locate the capital of Tripoli.

FIG. 513. — A Zulu woman making a carpet.

3. Southern Africa

Points of similarity to northern Africa

In some important respects northern and southern Africa are much alike, although they lie in different hemispheres. How do they resemble each other in climate (p. 374) and surface features (p. 373)? There is a resemblance, too, in the fact that both sections have long been settled by white men. What difference is there in the length of time that white men have occupied the two regions?

Control of the region

1. By the Dutch

It is to the Dutch that we owe the first important development of South Africa. Settling at Cape Town, and then spreading over the neighboring region, they took possession of the country occupied by the negroes, and introduced the industries of farming and ranching.

When Cape Colony, now called Cape of Good Hope, came into possession of the British (p. 377), many of the Dutch remained; but others emigrated, or "trekked," northward to find new homes in the interior, where they set up two republics, the Transvaal and the Orange Free State, in which they wished to continue the customs of their forefathers and follow the occupations of farming and herding.

2. By the English and other peoples

Doubtless the *Boers*, as these people are called, would have been left to themselves but for the discovery of rich deposits of gold in their new territory. The mines were worked by British capital, and trouble arose between the mine owners and the Boers. War followed, as a result of which the Transvaal and the Orange Free State were declared British colonies in 1900. Even before this the British had gained control of a large tract of land to the north of the Dutch country, in tropical Africa.

At present, therefore, the British control a broad strip of territory from the southern tip of Africa northward to the southern end of Lake Tanganyika. What are the names of the British colonies in South Africa (Fig. 495)? They are now united to form *The Union of South Africa.*

There are many British in South Africa, especially in Cape of Good Hope and at the gold mines of the Transvaal. There are also many savage negroes in this region, particularly in the tropical section, and in Zululand in northern Natal (Fig. 326). Some of them, like the Zulus (Fig. 513), have fiercely opposed the advance of the whites, and still maintain partial independence. They have made some progress toward civilization.

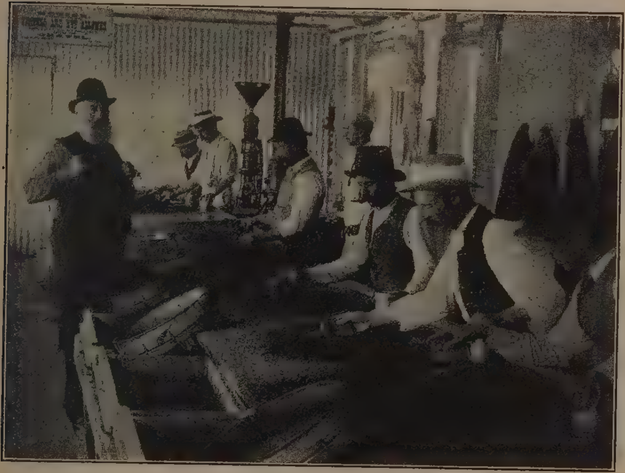

FIG. 514. — Workmen picking out diamonds at Kimberley.

Agriculture

Along the eastern coast, and in some of the interior valleys, agriculture is an important industry. Sugar cane, bananas, pineapples, tea, coffee, and rice are raised near the coast, where the climate is warm and damp. But wheat, tobacco, vegetables, and grapes are grown in the cooler south and upon the uplands wherever the rainfall is sufficient, or where irrigation is possible.

By far the greater part of South Africa is an arid plateau, and its elevation causes cold winters in spite of the latitude. Forests are lacking; but grass springs into life after the summer rains (November and December), and the country becomes green and beautiful. Then follows a long drought, when vegetation withers; but, as in the arid part of western United States, the grass dries on the ground and becomes hay upon which cattle and sheep thrive.

Upon this plateau, therefore, immense numbers of cattle, sheep, and goats are raised, and also many ostriches. In Cape of Good Hope alone there are about nineteen million sheep and goats, two million cattle, and three hundred and fifty thousand ostriches. From this it follows that the production of wool, hides, meat, and ostrich feathers is of great importance. Of what value are these products to Great Britain?

Mining

The discovery of gold in South Africa has brought great changes, as it did in the arid section of western United States. The gold is found scattered through a large bed of rock in the Transvaal, near the city of JOHANNESBURG, which on account of the valuable mines has become one of the largest cities of South Africa. This is now the most important gold-producing region in the world; indeed, more gold is mined here than in the whole United States.

Other valuable minerals, including copper, iron, and coal, also occur; but as yet they have been little developed. At KIMBERLEY, there are wonderful diamond mines, which now supply most of the diamonds used in the world.

The diamonds occur as rounded crystals in a partly decayed volcanic rock, and are obtained by digging out the soft rock and carefully removing the crystals (Fig. 514). After this, the crystals must be cut into the proper shape and polished. There are various grades, some clear and beautiful, others impure and dull. So productive is this deposit of precious stones that it has already yielded three hundred million dollars' worth of diamonds.

The lack of conveniences for transportation

The two chief rivers of South Africa are of little use as trade routes. The Orange River is not navigable, because of lack of water; moreover, there are rapids at the edge of the plateau. The other large river, the Zambezi, is navigable by small boats for a distance of three hundred miles from its mouth; but the climate near the coast, especially on the delta, is warm, damp, and unhealthful. Rapids check further navigation, and at one point there is a cataract, the Victoria Falls, which rivals even Niagara in grandeur. This cataract has a width of over a mile, and a height of four hundred and fifty feet. It is therefore both wider and higher than Niagara; but the volume of water is less.

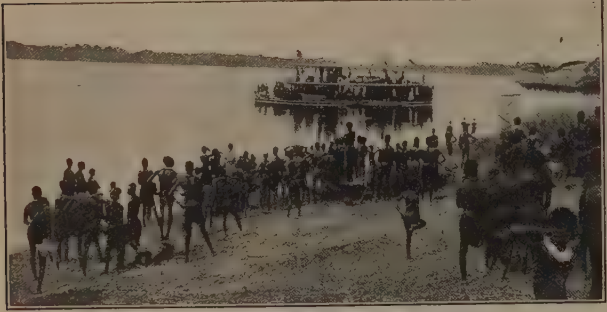

Fig. 515. — A steamboat on the Congo.

Not only are the rivers unsuited to the needs of internal commerce, but the coast is unfavorable to foreign commerce. For long distances there are no good harbors, while the river mouths are choked with sand bars.

Principal cities

A breakwater has made Table Bay a good port, and around its shores, beautifully situated at the base of Table Mountain (Fig. 498), is Cape Town, the capital and largest city of Cape of Good Hope. It is connected with the interior by a railway, which forms the southern end of the proposed railway from Cape Town to Cairo.

A second important harbor is that of Delagoa Bay, upon which is situated Lourenço Marquez, the capital of Portuguese East Africa. Being connected by rail with the interior, this port has been much used for the shipment of Transvaal products. Durban, the seaport of Natal, is a small city also connected with the Transvaal by rail.

The two principal interior cities are Kimberley and Johannesburg. For what are they noted (p. 385)? There is no important town in German Southwest Africa, which for the most part is an arid plateau. To what nation does *Walfisch Bay* belong?

4. Central Africa

This vast area is in large part unknown. Much of it is tropical forest; but on the northern and southern sides are open savannas (p. 374).

Value of the rivers for transportation

Owing to the heavy rainfall of the forest belt, the rivers are large. The Nile and Zambezi, already described, and the Niger and Congo, all receive water from the equatorial rains. The Niger is navigable in sections; but there are rapids in some parts, and in its northern portion the river dwindles in size because of the dry climate there. Its large tributary, the Benue, is navigable.

It is the immense Congo, which empties into the sea a few degrees south of the equator, that offers the best natural highway to central Africa. Unfortunately there is a series of falls in the river a short distance from the coast; but above Stanley Pool there are thousands of miles of navigable waters in the main river (Fig. 515) and its tributaries.

It was Stanley who first explored the Congo, in 1876; and since that time this part of Africa has been rapidly developing. Formerly it was necessary to carry goods around the rapids, each native porter carrying about sixty pounds on his back. Only in this way was Stanley able to take his boats to the navigable portion farther upstream. Now, however, a railway, two hundred and fifty miles in length, connects the lower Congo with Leopoldville, on Stanley Pool, above the falls. Thence, at all seasons of the year, steamers may go a thousand miles up the river, and also into many of the tributaries.

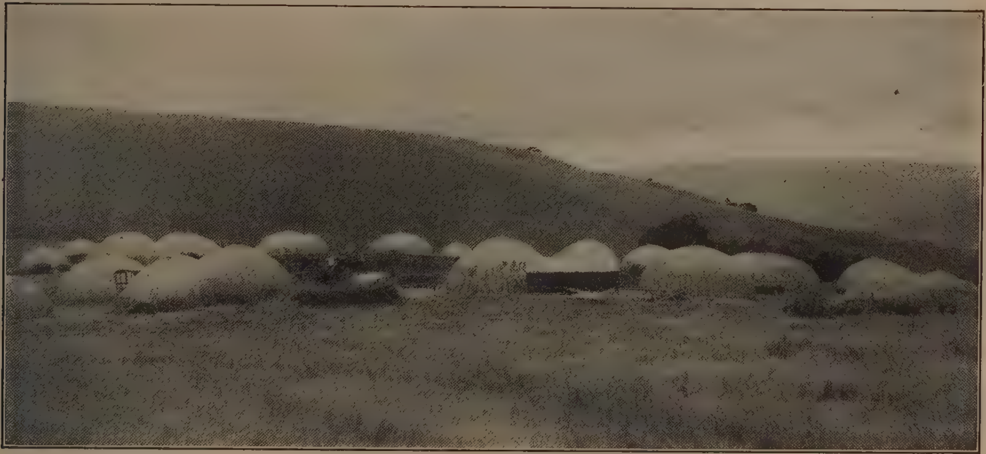

FIG. 516. — A negro village in Africa.

The native inhabitants

Very few Europeans have settled in central Africa and the native blacks live almost as their ancestors did. Most of the inhabitants live in huts made of brush, or some similar material, and clustered in villages (Fig. 516). They have a kind of tribal government, each tribe having a leader whose power is absolute, and under whom are minor chiefs. Some of the tribes are cannibals.

Among the blacks none are more remarkable than the *pygmies*, whom Stanley discovered in the dense tropical forests. The full-grown men are only three or four feet in height. They live by hunting, by gathering the vegetable products of the forest, and by theft from the neighboring agricultural tribes. Their villages are usually built in the forest where two paths cross. In that hot climate they find little need for clothing.

With a small spear, a short bow with poisoned arrows, and a knife, they hunt with wonderful skill; and by means of pitfalls they capture even the elephant. They know all the forest paths, and neither bird nor beast can escape them. According to Stanley, they offer one of the greatest obstacles to exploration; for they are stealthy, they attack a party with great courage, and can easily escape pursuit in the trackless forests.

Divisions of this region

European nations have been active in claiming the greater part of central Africa; but they have little real control over the native inhabitants. The following are some of the more important parts of central Africa.

1. The Sudan

The Sudan includes the vast area that lies between the Sahara and the tropical forest. What can you tell about its climate (p. 374)? More than half of the Sudan is claimed by the French, and most of the remainder, including *Nigeria* and the *Egyptian Sudan*, is held by the British. The inhabitants in the north are nomadic, while those in the south are agricultural, though they raise little more than is needed for their own use. There is some gold in the west; but the principal products are ivory, ostrich feathers, ebony, rubber, and gums.

The Sudan is difficult to reach, being bordered by the Sahara on the north, the tropical forest on the south, and the plateau edge elsewhere. Water routes are of little service, since some of the drainage is into the interior basins, like Lake Chad, and some into the Nile and Niger. The difficulty of reaching Timbuktu, for example, is shown by the fact that there is still an important caravan route from that place across the wide Sahara to the Mediterranean (p. 378).

Fig. 517. — Negroes and a native hut in Central Africa.

A railway to connect Timbuktu with the coast is now partly built. What effect must this have on the caravan route, if completed? Why? A railway has also been proposed across the Sahara from north to south; and already there is a railway into that part of the Sudan which the Nile crosses. With railways much of the open savanna country of the Sudan will doubtless be found attractive to white settlers.

2. Abyssinia and surrounding territory

East of the Sudan is *Abyssinia*, which is, for the most part, a rocky plateau, crossed by mountains, and difficult of access. The condition of this country is well shown by the fact that the position of the capital is changed when the supply of firewood is exhausted. It is evident, therefore, that there are no government buildings. The inhabitants, who are mainly of the white race, belong to different tribes which are often hostile to one another. Many of the people still hold to Christianity, in spite of the invasion by Mohammedans nearly four centuries ago. The exports of Abyssinia include coffee, hides, skins, ivory, and gold.

Abyssinia is surrounded by colonies of other nations. Italy holds *Eritrea* and *Italian Somaliland*. What other nations occupy a part of the coast on the border of Abyssinia?

3. Small countries on the west coast

The map shows several small countries on the west coast of Africa. The divisions colored pink belong to the British; those marked green to the Germans. What are some of their names? Find a section belonging to Spain. What parts are controlled by France?

One of these small countries is *Liberia*, which is of special interest to Americans. It is a negro republic, established in 1822 by Americans as a home for freed slaves; and its capital, MONROVIA, is named after President Monroe. No white man is allowed to become a citizen. The republic was modeled after *Sierra Leone*, next to it on the west, which the British founded as a home for liberated slaves.

Belgian Congo and neighboring territory

Belgian Congo, crossed by the equator and drained by the Congo and its tributaries, was founded by Leopold, king of Belgium, who supported Stanley in his explorations of this region. It is now under the control of Belgium. It is in large part a forest-covered plateau, but there are extensive areas of grass land. Hordes of savages, including the pygmies, inhabit the forests and savannas; the buffalo, elephant, and leopard live on the plains; and the roar of the lion is frequently heard. Large quantities of rubber, ivory, palm oil, gum, and cocoa, as well as tropical woods, are obtained from this region. Some gold is also exported.

East of the Belgian Congo are British and German territories. What are their names? What can you tell about their climate (p. 374)? What products would you expect?

Observe to what extent the British claim Africa. What break is there in the British territory between the Cape of Good Hope and the Mediterranean? What variety of climate do these British colonies include?

The need of more railways here

Several railways have already been mentioned. Where are they? Besides these, and parts of the great rivers, the three large lakes — Nyassa, Tanganyika, and Victoria Nyanza — are of great service in the transportation of goods. Already there are steamers upon these lakes. A railway connects Victoria Nyanza with the sea, and others are planned. But many more railways are needed; for otherwise caravans of native porters must bear the products on their backs, traveling along narrow paths through the forest.

5. Islands near Africa

Islands on the east side

The island of Madagascar, which is larger than any of our states except Texas, lies a little more than two hundred miles from the mainland. It contains much highland, especially on the eastern side; but the coastal region is lowland. The island is controlled by the French, and produces cattle, hides, valuable tropical woods, rubber, and coffee. While there are some Arabs, and tribes of negro origin in the west, the natives are for the most part Malays, called *Hovas*, who came by water from the northeast.

The principal small islands on the eastern side of Africa are *Zanzibar* (British) near the coast, and *Réunion* (French), and *Mauritius* (British) east of Madagascar. Find each of these (Fig. 496). There are many others, as you can see. These islands are of value as naval stations. Their inhabitants are engaged in fishing and in agriculture, raising sugar cane and other tropical products.

Islands on the west side

Of the many small islands near the western coast the northernmost are the *Madeira Islands*. These, together with the *Cape Verde Islands* farther southwest, have belonged to Portugal since the early Portuguese voyages of discovery (p. 377). The *Canary Islands*, which belong to Spain, lie between these two groups.

Ascension Island and *St. Helena*, south of the equator, are volcanoes, like the other groups of islands just named. They belong to Great Britain. St. Helena is noted especially as the prison home of Napoleon Bonaparte.

Review Questions

1. What is the general shape of Africa? What about the regularity of its coast line? 2. Describe the arrangement of its mountains and lowlands. 3. State the effect of this arrangement on the rivers. 4. Where are the principal lakes, and what are their names? 5. Describe the climate in general. 6. Tell about the forest belt. 7. The savannas north and south of it. 8. The two desert regions. 9. What about the native plant and animal life? 10. What about the native inhabitants of Africa? 11. Tell about the exploration and settlement. 12. What are the divisions of northern Africa, and what is their form of government? 13. What is the area of the Sahara? 14. Describe its surface features. 15. Tell about the caravans there. 16. Describe the climate of Egypt. 17. What can you tell about the Nile River? 18. Name the agricultural products of Egypt. 19. Give some facts in the history of that country. 20. Locate and describe the Suez Canal. 21. Locate and state the chief facts about the leading cities. 22. What about the surface, climate, and products of the Barbary States? 23. What is the character of the people? 24. Name and locate the principal cities. 25. How does the southern part of Africa resemble the northern part? 26. State what you can about the government of the southern part. 27. What do you know about the agriculture there? 28. The mining? 29. The lack of conveniences for transportation? 30. Locate and state the chief facts about the leading cities. 31. How valuable are the rivers of central Africa for transportation? 32. Tell about the native inhabitants. 33. Locate the Sudan and name its divisions. What about conveniences for transportation there? 34. State the principal facts about Abyssinia and surrounding territory. 35. Name and locate the small countries on the west coast. 36. State the principal facts about the Belgian Congo and neighboring territory. 37. Explain the need of railways there? 38. Locate and describe Madagascar. 39. Locate island groups near Africa. To what nation does each group belong?

General review questions and comparisons

1. Give several reasons why Africa has been explored and settled so much later than either North or South America. 2. What rivers of North America resemble those of Africa in having rapids and falls that interfere with commerce? How have these obstacles been overcome in our rivers? 3. Contrast the Mississippi River with the Nile. Make a drawing of each, showing the principal tributaries and towns. 4. Compare the Congo with the Missouri in length; with the Amazon (Appendix, p. 431). 5. Compare the area of Lake Victoria Nyanza with that of Lake Superior (Appendix, p. 431). 6. Is Africa, on the whole, as well adapted to agriculture as is South America? Give your reasons. 7. Make a sketch map of the Atlantic, and compare the position of Africa with that of South America. What part of America is in the same latitude as the Sahara? 8. Cape Horn is how much farther south than Cape of Good Hope? 9. Why is not a large part of northern South America a desert, like northern Africa? 10. Compare southern Africa with southern South America in products and importance. Why the difference? 11. What products of Africa are also cultivated in the United States? 12. What products of Africa are not raised in our country?

Suggestions

1. What per cent of the present population of the United States belongs to the negro race? 2. Read the Bible story of Joseph in Egypt. 3. Read the story of Moses. 4. Find out some facts about the Pyramids. 5. Why is England especially benefited by the Suez Canal? 6. What obstacles are in the way of building railways across the Sahara? 7. Read about our short war with Tripoli in 1804. 8. Why was the southern point of Africa called the Cape of Good Hope? 9. Examine a diamond to see how it has been cut. 10. Find out something about missionary work in Africa. 11. Find out about the peculiar animal life upon the island of Madagascar. 12. Find some facts about Livingstone, Mungo Park, Stanley, and other African explorers. 13. Read one of the books of these explorers; you will find Du Chaillu's books on Africa very interesting. 14. Who were Bartholomew Diaz and Vasco da Gama, and what part did they take in the discovery of the water route to India? 15. Find out about Kruger and the British war with the Boers in 1900.

III. Australia and Island Groups

I Australia

Map Questions

1. Judging from the railways and cities, which is the best settled part of Australia? 2. Which part is least settled? 3. Can you suggest any reasons for these facts? 4. From the lakes and rivers, what do you conclude concerning the climate of the interior? 5. How does Tasmania compare in area with Pennsylvania (Appendix, p. 425)? With your own state? 6. Make the same comparison for New Zealand. 7. For Borneo and New Guinea. 8. What nations claim parts of Borneo? New Guinea?

Location and area

Australia lies apart from the rest of the world. It is the smallest of the continents, the only continent wholly surrounded by water, and the only continent wholly in the southern hemisphere. With its area of three million square miles, it approaches the United States or Europe in size.

Surface features

The surface, like that of Ireland, suggests a plate in form, since the low interior rises gradually to a broken rim of plateaus and mountains of moderate height. While there are some low, short ranges in the interior, the highest land is in the east, where the mountains run parallel to the coast. In the southeast some of the peaks reach a height of over a mile.

The coast of Australia is so regular that for long distances there are no good harbors; but the sinking of the land in the southeastern part has formed some excellent ports. Off the northeastern coast is the *Great Barrier Reef*, the longest coral reef in the world.

Climate

What is the latitude of the northern part of Australia? Of the southern part? What, therefore, can you say about the temperature of the continent?

Australia lies within the belt of the southeast trade winds (Fig. 300). The eastern highland, therefore, has an abundant rainfall, on its seaward side, and is clothed with dense forests. After crossing the mountains, however, the winds are so dry that the forest gradually disappears; and the interior is a vast desert. It is therefore only along portions of the coast that there is enough rainfall for agriculture, while the interior, and much of the greater part of the continent, is either arid or desert.

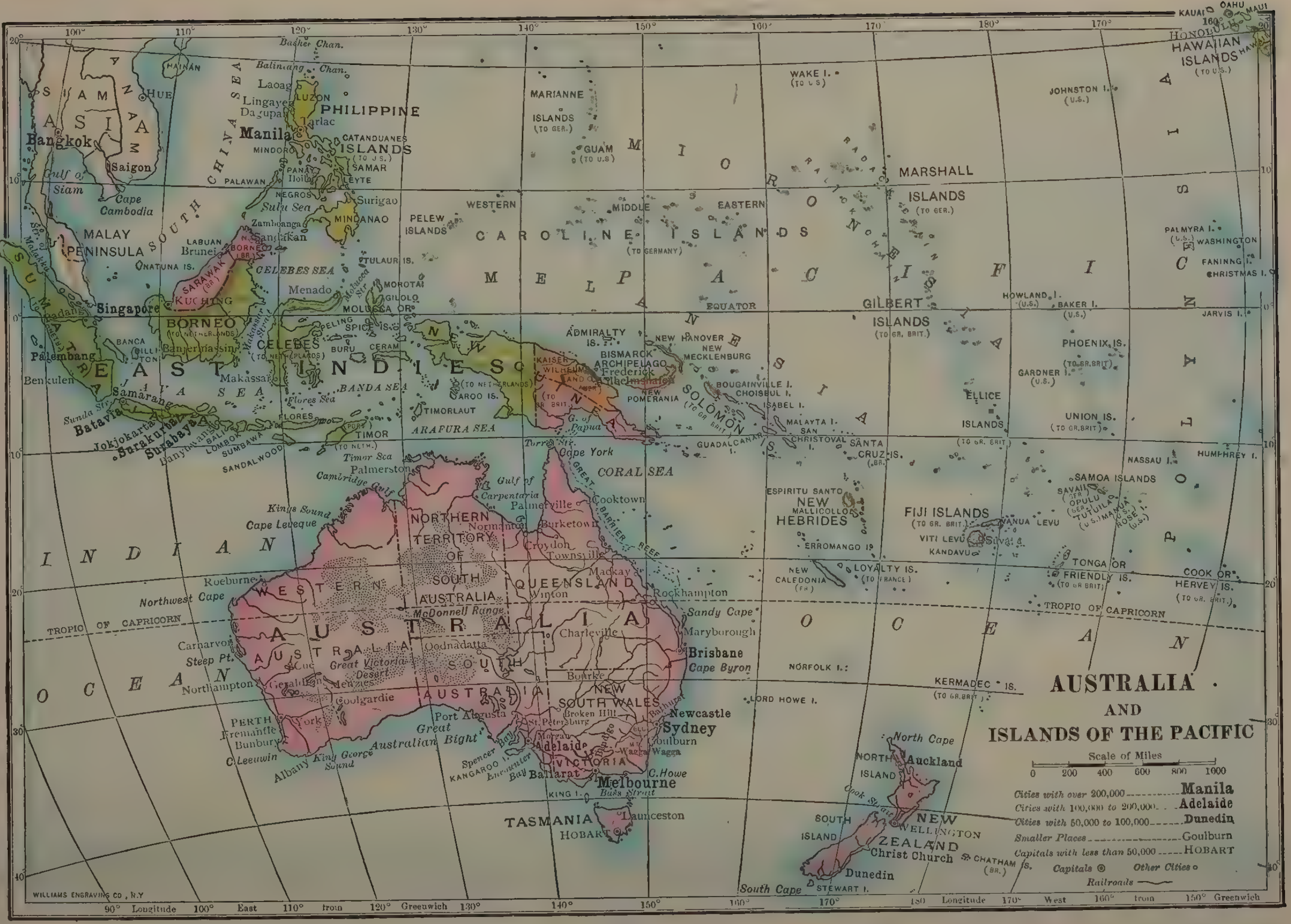
AUSTRALIA
AND
ISLANDS OF THE PACIFIC
Scale of Miles
0 200 400 600 800 1000
Cities with over 200,000 Manila
Cities with 100,000 to 200,000 Adelaide
Cities with 50,000 to 100,000 Dunedin
Smaller Places Goulburn
Capitals with less than 50,000 HOBART
Capitals
Other Cities
Railroads
WILLIAMS ENGRAVING CO., N.Y.
Longitude East from Greenwich
Longitude West from Greenwich
INDIAN OCEAN
PACIFIC OCEAN
MICRONESIA
MELANESIA
POLYNESIA
AUSTRALIA
WESTERN AUSTRALIA
NORTHERN TERRITORY OF SOUTH AUSTRALIA
SOUTH AUSTRALIA
QUEENSLAND
NEW SOUTH WALES
VICTORIA
TASMANIA
NEW ZEALAND
NORTH ISLAND
SOUTH ISLAND
EAST INDIES
ASIA
SIAM
ANNAM
MALAY PENINSULA
SUMATRA
BORNEO
CELEBES
JAVA SEA
PHILIPPINE ISLANDS
NEW GUINEA
CAROLINE ISLANDS (TO GERMANY)
MARIANNE ISLANDS (TO GER.)
MARSHALL ISLANDS (TO GER.)
GILBERT ISLANDS (TO GR. BRIT.)
BISMARCK ARCHIPELAGO
SOLOMON IS.
NEW HEBRIDES
NEW CALEDONIA (FR.)
LOYALTY IS. (TO FRANCE)
FIJI ISLANDS (TO GR. BRIT.)
SAMOA ISLANDS
TONGA OR FRIENDLY IS.
COOK OR HERVEY IS.
ELLICE ISLANDS
PHOENIX IS.
UNION IS.
HAWAIIAN ISLANDS (TO U.S.)
JOHNSTON I. (U.S.)
WAKE I. (TO U.S.)
GUAM (TO U.S.)
PALMYRA I.
WASHINGTON
FANINNG I.
CHRISTMAS I.
JARVIS I.
HOWLAND I.
BAKER I.
NORFOLK I.
LORD HOWE I.
KERMADEC IS.
CHATHAM IS.
TROPIC OF CAPRICORN
EQUATOR
CORAL SEA
ARAFURA SEA
BANDA SEA
CELEBES SEA
SULU SEA
SOUTH CHINA SEA
Timor Sea
Gulf of Carpentaria
GREAT BARRIER REEF
Great Australian Bight
Bass Strait
Cook Str.
Torres Str.
Bangkok
Saigon
Hue
Manila
Singapore
Batavia
Samarang
Surabaya
Makassar
Menado
Kuching
Palembang
Benkulen
Perth
Fremantle
Bunbury
Albany
Coolgardie
Roeburne
Carnarvon
Northampton
Geraldton
Palmerston
Port Augusta
Adelaide
Ballarat
Melbourne
Sydney
Newcastle
Goulburn
Wagga Wagga
Brisbane
Maryborough
Rockhampton
Mackay
Townsville
Cooktown
Charleville
Broken Hill
Hobart
Launceston
Auckland
Wellington
Christ Church
Dunedin
Honolulu
Cape York
North Cape
South Cape
C. Leeuwin
C. Howe
Cape Byron
Sandy Cape
Northwest Cape

FIG. 518.

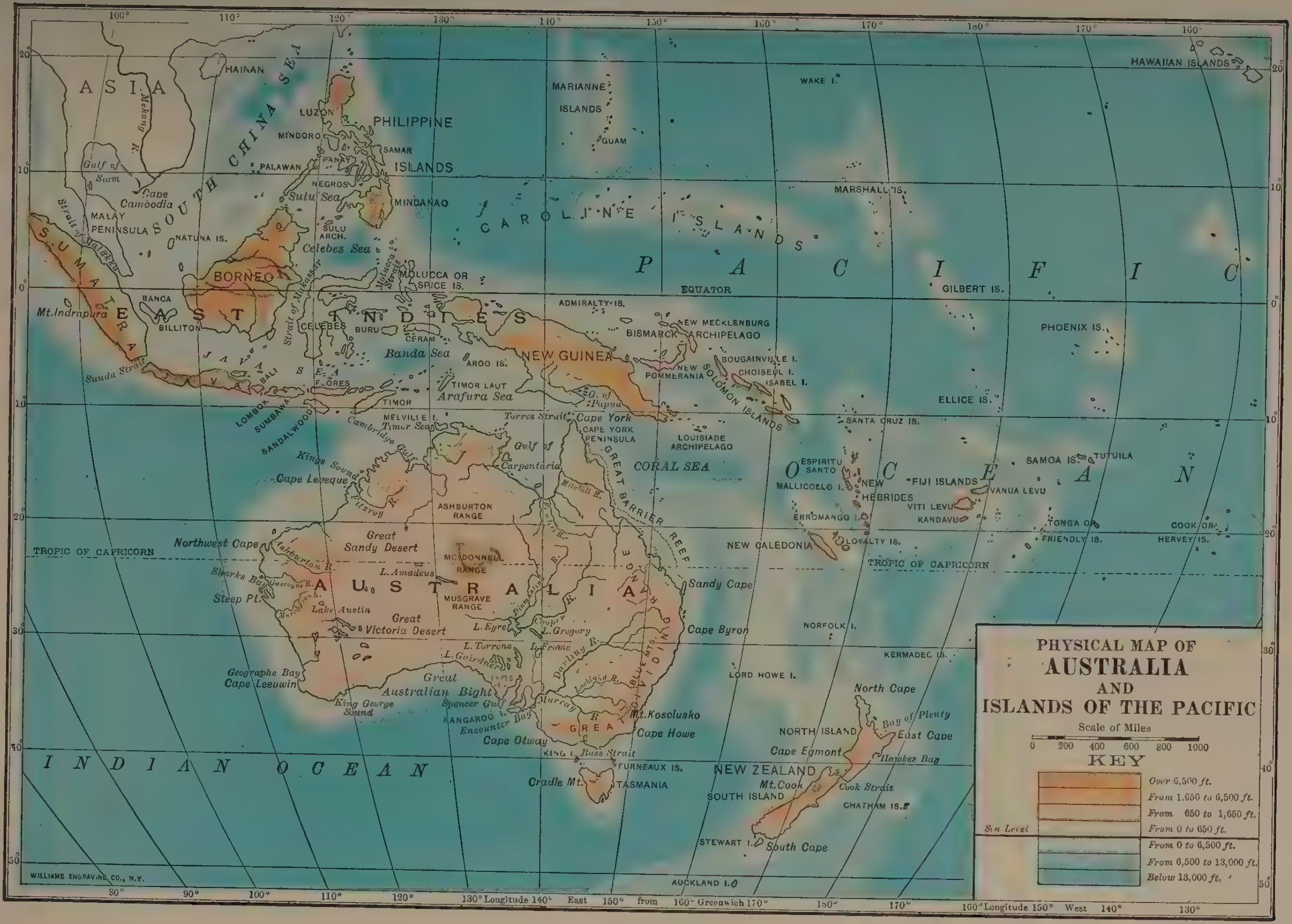
PHYSICAL MAP OF
AUSTRALIA
AND
ISLANDS OF THE PACIFIC
Scale of Miles
0 200 400 600 800 1000
KEY
Over 6,500 ft.
From 1,650 to 6,500 ft.
From 650 to 1,650 ft.
From 0 to 650 ft.
Sea Level
From 0 to 6,500 ft.
From 6,500 to 13,000 ft.
Below 13,000 ft.
WILLIAMS ENGRAVING CO., N.Y.
130° Longitude 140° East 150° from 160° Greenwich 170°
160° Longitude 150° West 140°
ASIA
Mekong R.
HAINAN
Gulf of Siam
Cape Cambodia
MALAY PENINSULA
Strait of Malakka
SUMATRA
Mt. Indrapura
SOUTH CHINA SEA
LUZON
MINDORO
PALAWAN
PHILIPPINE ISLANDS
SAMAR
PANAY
NEGROS
MINDANAO
Sulu Sea
SULU ARCH.
Celebes Sea
NATUNA IS.
BORNEO
BANCA
BILLITON
EAST INDIES
Strait of Makassar
Molucca Strait
MOLUCCA OR SPICE IS.
CELEBES
BURU
CERAM
Banda Sea
AROO IS.
TIMOR LAUT
Arafura Sea
JAVA
BALI
Sunda Strait
LOMBOK
SUMBAWA
SANDALWOOD
FLORES
TIMOR
MELVILLE I.
Timor Sea
Cambridge Gulf
Kings Sound
Cape Leveque
Fitzroy R.
NEW GUINEA
G. of Papua
Torres Strait
Cape York
CAPE YORK PENINSULA
Gulf of Carpentaria
Mitchell R.
Flinders R.
ASHBURTON RANGE
Great Sandy Desert
MC DONNELL RANGE
L. Amadeus
MUSGRAVE RANGE
AUSTRALIA
Northwest Cape
Ashburton R.
Sharks Bay
Gascoyne R.
Murchison R.
Steep Pt.
Lake Austin
Great Victoria Desert
L. Eyre
Diamantina R.
Cooper Cr.
L. Gregory
L. Frome
L. Torrens
L. Gairdner
Darling R.
Lachlan R.
Murray R.
Geographe Bay
Cape Leeuwin
King George Sound
Great Australian Bight
Spencer Gulf
KANGAROO I.
Encounter Bay
Cape Otway
GREAT DIVIDING RANGE
BLUE MTS.
Mt. Kosciusko
Cape Howe
KING I.
Bass Strait
FURNEAUX IS.
TASMANIA
Cradle Mt.
Sandy Cape
Cape Byron
GREAT BARRIER REEF
CORAL SEA
LOUISIADE ARCHIPELAGO
TROPIC OF CAPRICORN
INDIAN OCEAN
MARIANNE ISLANDS
GUAM
CAROLINE ISLANDS
PACIFIC OCEAN
EQUATOR
ADMIRALTY IS.
BISMARCK ARCHIPELAGO
NEW MECKLENBURG
NEW POMMERANIA
BOUGAINVILLE I.
CHOISEUL I.
ISABEL I.
SOLOMON ISLANDS
WAKE I.
MARSHALL IS.
GILBERT IS.
PHOENIX IS.
ELLICE IS.
SANTA CRUZ IS.
ESPIRITU SANTO
MALLICOLLO I.
NEW HEBRIDES
ERROMANGO I.
NEW CALEDONIA
LOYALTY IS.
FIJI ISLANDS
VANUA LEVU
VITI LEVU
KANDAVU
SAMOA IS.
TUTUILA
TONGA OR FRIENDLY IS.
COOK OR HERVEY IS.
HAWAIIAN ISLANDS
NORFOLK I.
LORD HOWE I.
KERMADEC IS.
North Cape
Bay of Plenty
East Cape
NORTH ISLAND
Cape Egmont
Hawkes Bay
NEW ZEALAND
Mt. Cook
Cook Strait
SOUTH ISLAND
CHATHAM IS.
STEWART I.
South Cape
AUCKLAND I.

FIG. 519.

Effect of rainfall on rivers and distribution of population

The maps of Australia show a striking lack of large rivers. Some of the streams end in salt lakes, and others evaporate in the dry climate. Many unite with the Darling and Murray rivers; but these only at times are navigable for long distances. During the dry summer season all except the Murray may dwindle to mere chains of water holes. A sand bar at the mouth of the Murray River closes it to ocean steamers, so that, unlike the Mississippi, no large cities have grown up along its banks.

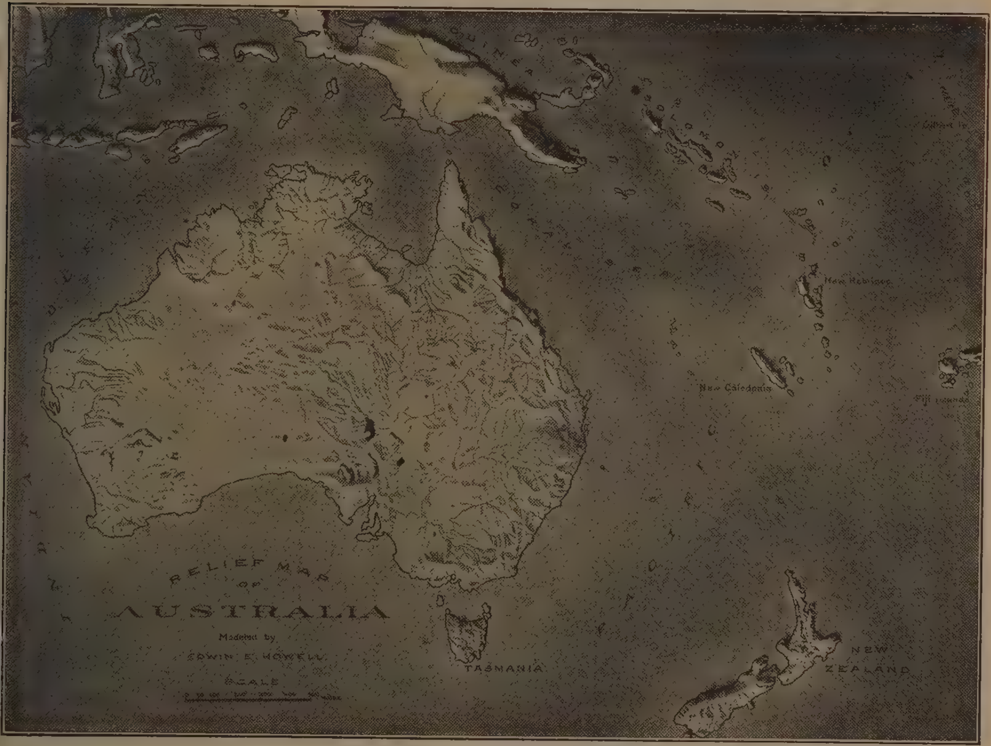

FIG. 520. — Relief map of Australia.

Partly because of the desert, and partly because of the absence of navigable streams, there are large tracts in the interior about which, even now, little is known. Only the southeastern part seems capable of supporting a dense population.

Native plants

Australian vegetation is peculiar and well suited to the climate of the country. Among the desert grasses, one of the most remarkable is the porcupine grass, which is so hard, wiry, and spiny as to prevent passage through it.

The "scrub" trees of the arid interior have developed a foliage able to resist evaporation. For example, the gum trees (Eucalyptus) hold their narrow leaf blades vertically, with only the edges toward the sun's rays; the leaves of wattles (Acacia) and other plants have shrunk to thorns; and some trees secrete odorous oils which check evaporation. Plants with leaves which taste of salt also thrive here. These "salt bushes" are so valuable as forage for sheep and cattle that they are now introduced into the arid section of southwestern United States.

On the equable rainy slopes, near the coast, some of the gum trees are giants. They rival the "Big

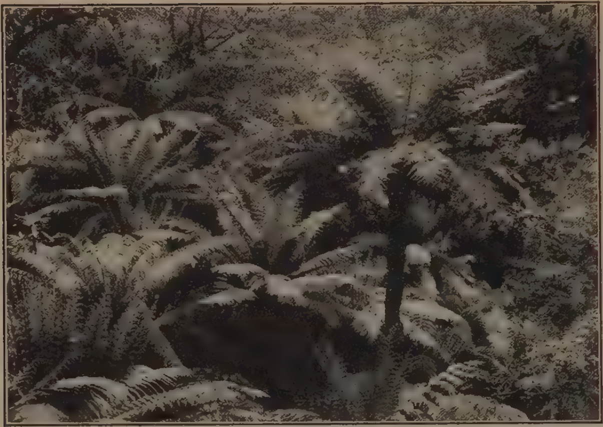

Fig. 521. — Tree ferns and other undergrowth in the Australian forest.

Trees" of California, which also thrive where damp winds blow from the ocean. The undergrowth of the forest (Fig. 521), which is almost tropical in character, includes tree ferns, palms, and orchids. These dense woods are called the "bush."

Native animals

Figure 523 shows the more important animals, including the rabbit, which was introduced into Australia from Europe. What are their names? They are very different from animals in other parts of the world, because Australia is so far separated by water from all the other continents that animals from other places have not been able to migrate there.

History

1. Native inhabitants and their manner of life

When discovered, Australia was sparsely settled by blacks, related to the negroes of Africa. Some of these natives still live in the interior, building the rudest of shelters, and gaining their living by hunting. They still use that peculiar weapon, the *boomerang*, which, when skillfully thrown, will fly in curves and even return to the thrower.

2. Early settlement

Although it had long been known that there was an Australian continent, settlements were not made there until 1788. For a time the distant land was used as an English prison; and naturally, under such conditions, not many free settlers came to the country. Some came, however, and as their number increased, they brought it about that criminals were no longer sent there.

3. Effect of discovery of gold

Almost at the same time that gold was discovered in California, it was also found in Australia, and tens of thousands of people rushed there to wash the sands for the precious metal. Since the miners needed supplies, many of the settlers turned their attention to other industries, especially agriculture and grazing. Therefore, in Australia, as in California, the gold mines quickly led to the development of the country's resources.

4. Government

New South Wales, as the first colony was called, finally grew so large, and the settlements were so scattered, that it became difficult to control the whole colony under a single government. To meet this difficulty, Tasmania, Victoria,

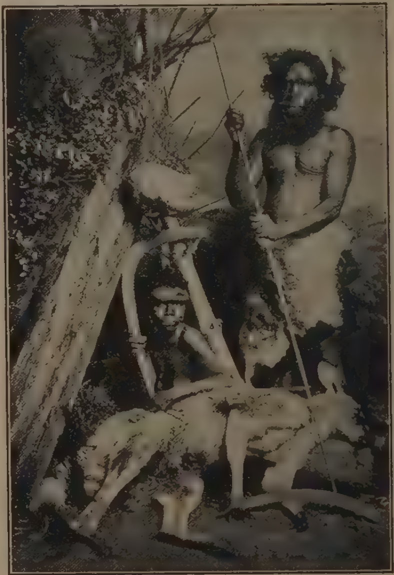

Fig. 522. — Australian natives, who have just killed a kangaroo with the boomerang. The boy holds a boomerang in his hands.

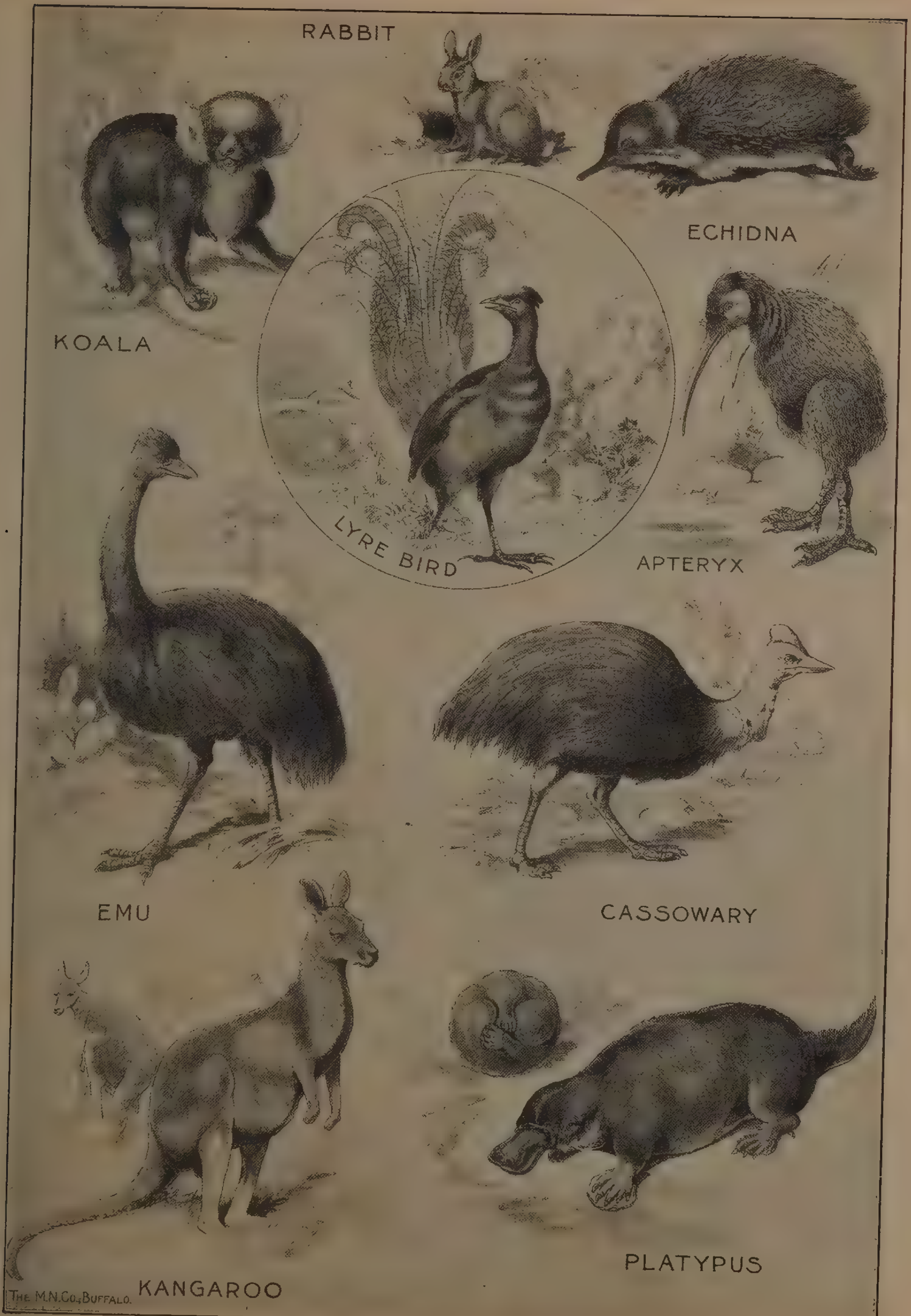

FIG. 523. — Some of the Australian animals.

and Queensland were one by one set off as separate colonies. South Australia and Western Australia were settled as distinct colonies.

The colonies have so many interests in common, that, in 1901, they united to form the *Commonwealth of Australia*. This new commonwealth has a government similar to that of Canada, and is independent of England in all matters except those which affect the British Empire as a whole.

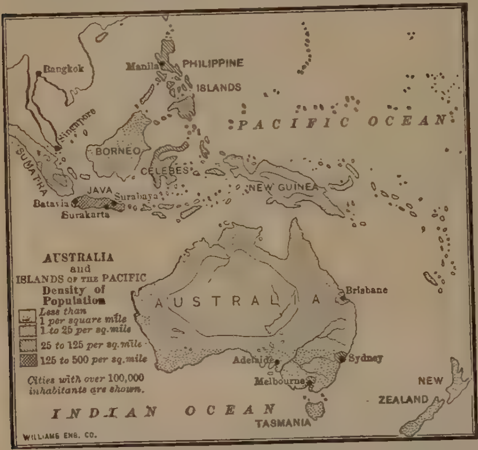

FIG. 524.—Density of population in Australia and neighboring islands.

Agriculture

1. Sheep raising

Although it was gold that brought the rush of settlers to Australia, her greatest wealth lies in her flocks of Merino sheep. Australian wool is the finest in the world.

Sheep were first known in Asia, where doubtless they were originally wild animals; and the ancestors of the Merino were such as those tended by Jacob. From Asia the breed spread along the Mediterranean and found in Spain a favorable, dry climate. From this point flocks were taken to the early Dutch colony of South Africa, and thence to Australia. Here the dry climate and native plants have still further improved the quality of the wool.

In the early days of Australia the flocks were reared upon the unfenced government land, as in the western part of the United States (p. 133). The sheep were driven to pasture and watered and cared for at night by lonely shepherds, much as in the days of David. Now, however, the land is largely fenced with wire, each sheep station having its own *run*, or ranch. To-day grazing is the most typical as well as the leading occupation in Australia. There are over eighty-three million sheep, and wool is the principal export of the commonwealth.

2. Other animals and animal products

Horses, cattle, and swine are also raised in large numbers; and frozen or canned beef and mutton, together with hides and tallow, are exported. Many cattle are raised for their dairy products, and butter is sent to England. At the season when the cows of Belgium and Denmark are kept in barns on account of the cold, the dairy herds of New South Wales feed on fresh pastures. How can you account for this fact?

3. Farming

On the damp lowlands, where there is rainfall enough, and in the interior where irrigation is possible, there is much farming. Next to hay, wheat (Fig. 536) is the most important crop, and flour forms one of the chief exports of the country.

The farm products vary with the climate. For example, oats and other hardy grains are raised in the cooler south, while corn is important only from New South Wales northward. There are large sugar plantations in Queensland; and along the northern coast tropical products are obtained. Much fruit is raised, and this, too, varies with the climate. Oranges are grown in the north and the orchard and small fruits of cool temperate lands in the south. In Victoria and South Australia, there are many vineyards.

Fishing and mining

On the coral reefs east of the mainland and along the northern coast of Australia small sailboats are engaged in fishing for pearls, pearl shell, and other products of tropical waters.

The gold of Australia, like that of California, was first found in the gravels; bu mines were later opened along the veins i the mountain rocks. Gold mining is sti very important, and Australia ranks thir among gold-producing nations (Fig. 556).

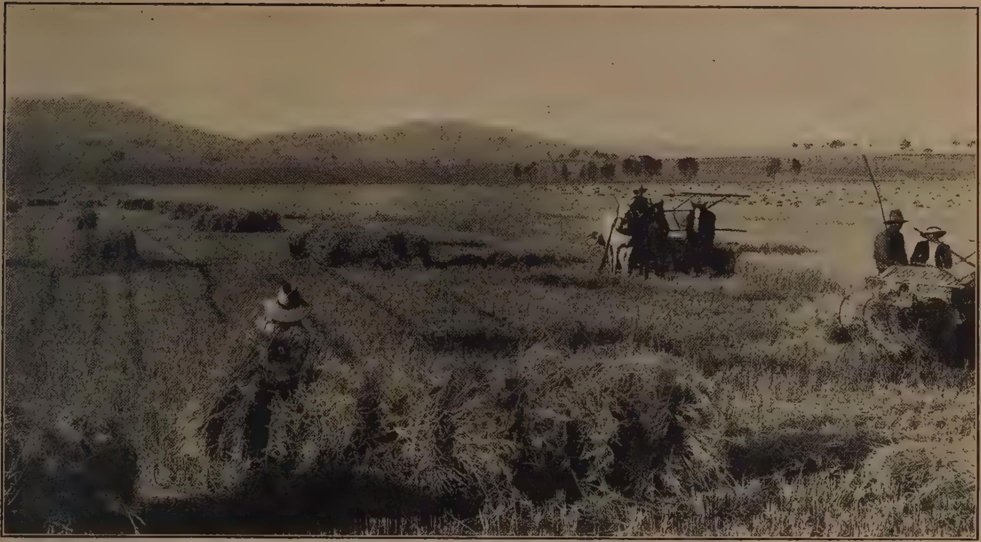

FIG. 525. — Harvesting oats in Australia.

Copper, silver, and tin are other important metals found in Australia. Coal of good quality exists in several places, the best-developed field being near the coast of New South Wales. Rich iron ores, together with limestone, are found near these coal fields.

Manufacturing

Some wool is woven into cloth; some leather is tanned and made into shoes; and much flour is made from the wheat. There are sawmills and planing mills; and other forms of simple manufacturing are carried on. But most of the manufactured goods used in the country are imported. They are largely obtained from England, and are paid for with raw products.

Principal cities
1. The capitals

Australian cities have grown very rapidly, and one third of the people live in the capitals of the six divisions of the commonwealth. These capitals are seaports connected with the interior by railway, and have therefore become the leading commercial centers. They have fine government buildings and large public parks and gardens.

MELBOURNE, the second city in size in Australia and the capital of Victoria, is beautifully situated at the head of a broad harbor. SYDNEY (Fig. 526), the largest city of Australia and the capital of New

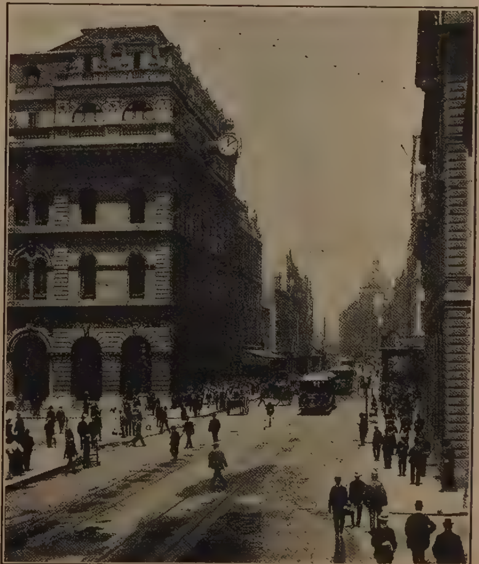

FIG. 526. — A street in Sydney, in New South Wales.

South Wales, was founded in 1788, and is, therefore, the oldest city of Australia. Both of these cities rank among the great seaports of the British Empire. ADELAIDE is a third large city. Of which division is it the capital? Name the other capitals.

2. Mining centers

Since nine tenths of the Australians live on the coast lands, much of the commerce is carried on by means of steamboats, and most of the cities are seaports connected by rail with the interior farms, mines, and sheep country. A few mining centers, like BALLARAT and BENDIGO, in Victoria, have become large towns.

2. Island Groups

New Zealand

1. Surface and climate

More than a thousand miles southeast of Australia are the two large mountainous islands of New Zealand. In South Island there are great glaciers among the mountains; while in North Island there are active volcanoes, and also hot springs and geysers (Fig. 527), like those of the Yellowstone National Park.

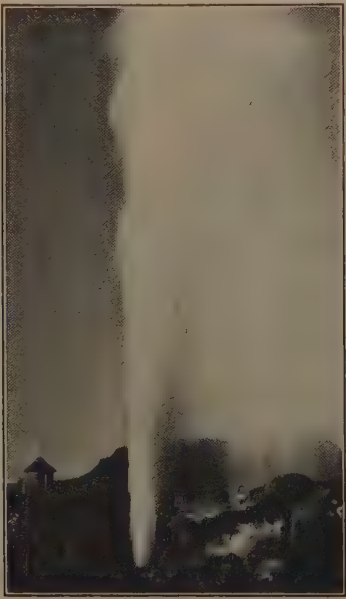

FIG. 527. — A geyser in eruption in New Zealand.

Since these islands lie in the belt of stormy west winds, there is heavy rainfall on the western slopes. The mountains are therefore clothed with forests of pine and other trees. On the lee, or eastern, slopes the rainfall is less, and the land is covered with wiry grasses. What effect must the presence of water on all sides have upon the temperature?

2. Native inhabitants

The native people, or *Maoris*, who must have come to the islands in boats, were a hardy, warlike race, living in protected villages, in the midst of cultivated fields. At first they opposed the white men, and the country was not settled until a half century after the founding of Sydney. After a time the Maoris were conquered, and those that survive live mostly in the interior of the North Island. Many of them are civilized, and they are now allowed representatives in the legislature.

3. Industries and government

As in Australia, pastoral industries take the lead. There are twenty million sheep, and wool and frozen mutton are exported to England. Cattle are likewise kept, and butter is exported. Agriculture is important, but much land that is suited to farming has never been cleared of forest.

In the south the crops are those of the cool temperate belt; but in the north the climate is mild enough for the growth of oranges. There are gold, silver, and coal mines among the mountains; and valuable timber is obtained from their slopes. Manufacturing is only slightly developed, and is chiefly for home use.

The situation of these islands, in the temperate zone, is favorable to rapid progress, and the British people who have settled here have done much to develop the resources. They have also established one of the best governments in the world. Being so far away from Australia, and therefore, with such different interests, New Zealand has not joined the Australian Commonwealth.

4. Commerce and chief cities

Several short lines of railway connect the settled interior with the seaports; roads and stage lines extend to the more distant districts; and steamers ply around the coasts and to distant countries. There are four cities of nearly the same size, the smallest of which is DUNEDIN, and the largest, AUCKLAND. Find the other two.

The East Indies

1. Divisions among them

Between Asia and Australia are hundreds of islands, some very large, others so small that they find no place on our map. Of these the greater number have animals, plants, and people similar to those of Asia. New Guinea, however, which is nearest to Australia, resembles that continent rather than Asia.

While the islands farther west are overrun with Malays from Asia, the natives of New Guinea are like the native Australians. The animal life also resembles that of Australia. It is believed, therefore, that New Guinea and Australia were once connected. For these reasons New Guinea is usually considered a part of Australia, while the islands to the west and northwest are classed with Asia.

The *Philippine Islands*, which belong to the United States, are really a northern extension of the East Indies. What can you tell about them (p. 158)?

2. Government of the Islands

Many of the islands of this region, including Sumatra, Java, the Celebes, and a large part of Borneo and New Guinea are *Dutch colonies.* What nations control the island of Timor? What three nations have possession of New Guinea?

3. Their area

The immense size of these islands is shown by the fact that Java has a greater area than New York State, while Sumatra is larger than California. Borneo, one of the largest islands in the world, is larger than all the New England and Middle Atlantic States together. *New Guinea*, another of the largest islands in the world, has an area greater than that of Texas. The Dutch East Indies alone are fifty-eight times as large as The Netherlands, and have over six times as many inhabitants, or not quite half as many as the United States.

4. Their surface and climate

All of the larger islands are mountainous; in fact, they are parts of mountain ranges rising out of the sea, and among them are many active volcanoes, some of which have had terribly destructive eruptions. Many of the smaller islands are merely coral reefs slightly raised above the ocean.

Lying so near the equator, all the islands have a tropical temperature and heavy rainfall. The dampness and heat together make them very unhealthful in places. Because of the climate, and of the mountains and the dense jungles, there are large areas which have never been explored.

5. The products

The forests supply valuable woods and gums, including rubber and camphor. Large areas, especially in Java, are highly cultivated and produce quantities of rice, sugar cane, and coffee. In the production of the last two articles, Java is one of the leading regions of the world (Figs. 539 and 542). Among the noted products of the East Indies are spices, such as pepper, cloves, and nutmegs; in fact, one of the island groups is known as the Spice Islands. What is its other name? There are also valuable minerals, including tin, gold, and precious stones; and in the tropical sea beautiful pearl shells are found.

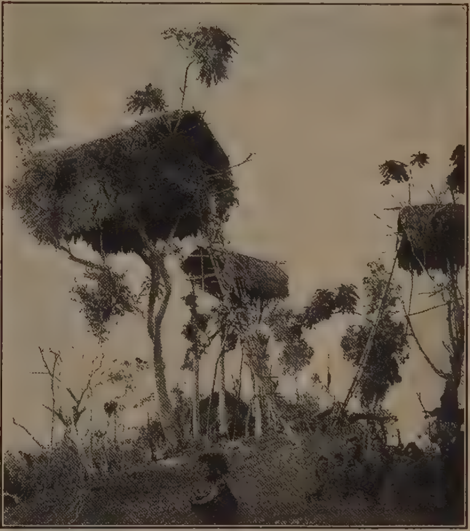

FIG. 528.—New Guinea houses built in trees.

The largest city among all the islands in this region is MANILA, in the Philippines; and next in size is BATAVIA, the center of the Dutch colonial government.

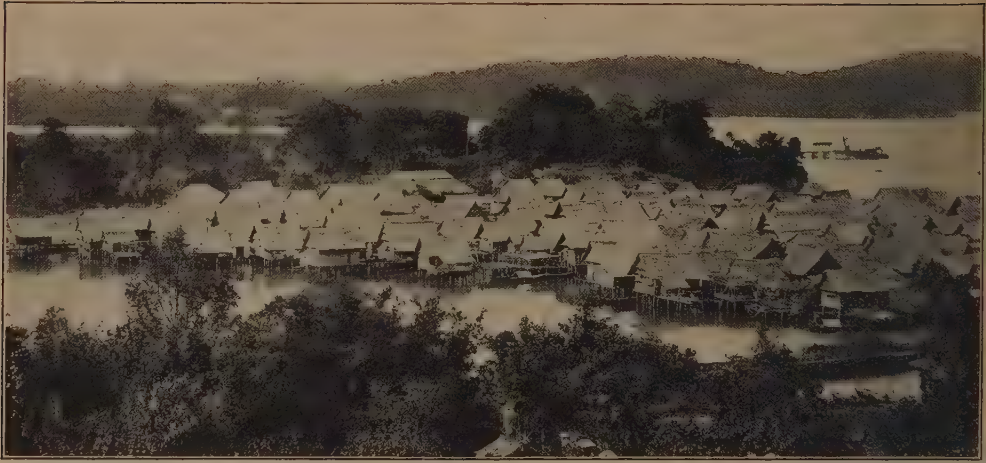

FIG. 529. — A Malay village built on piles in the water.

Islands of the Pacific

The map (Fig. 518) shows the western Pacific dotted with island groups; but all these islands are very small. What names among them have you heard before? Name and locate those that belong to the United States. All together, these thousands of islands have a population of less than a million persons.

The "high," or volcanic islands, like Fiji and New Caledonia, have peaks which rise several thousand feet. On these islands there are sugar and coffee plantations, as in Hawaii, while tropical fruits, such as bananas and pineapples, are raised in large quantities.

On the "low," or coral islands, on the other hand, the cocoanut palm is the mainstay of human life, supplying food, clothing, shelter, boats, and many utensils. Copra, the main export from Samoa, and from many other Pacific islands, is the dried meat of the cocoanut. It is of value for food, as well as for its oil.

Review Questions

1. Describe the surface of Australia, including the coast line. 2. Describe the climate. 3. State the effect of the rainfall on rivers, and distribution of population. 4. What about the native plants? 5. Native animals? 6. In the history of the country, give some facts about the native inhabitants; the early settlements; effect of discovery of gold; the government. 7. State the principal facts about sheep ranching. 8. Other animals and animal products. 9. Name the chief farm products. How are they distributed? 10. What about fishing? 11. What mineral products are found? 12. What is the condition of manufacturing? 13. Name and locate the principal cities. For what is each important? 14. What are the surface features and climate of New Zealand? 15. What about the native inhabitants? 16. The industries and government? 17. Name and locate the chief cities. 18. Tell about the East Indies; divisions among them; government; area; surface and climate; products and chief city. 19. What can you tell about the islands of the Pacific?

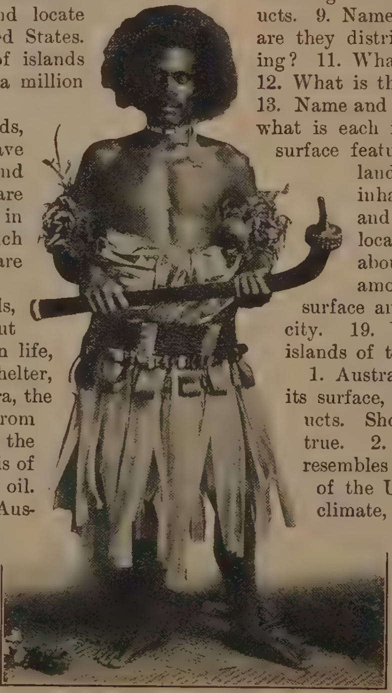

FIG. 530. — A native of Fiji Islands.

General review questions and comparisons

1. Australia resembles South Africa in its surface, climate, occupations, and products. Show how this is true. 2. Australia also resembles the western part of the United States in climate, in occupation and products, and in the order of development of her resources. Show how this is true, also. 3. In what respects does southern South America (Chile and Argentina) resemble Australia? 4. What part of Australia has the same latitude, in the southern hemisphere, that

southern Florida has in the northern? 5. Which one of our states most nearly equals New Zealand in area? 6. What peninsula of Europe resembles New Zealand in shape? How do the two countries compare in area? In population? 7. What part of South America most resembles the East Indies in climate and products? What part of North America most resembles them in these respects?

Suggestions

1. If it were within your power, how would you arrange the highlands of Australia so as to secure the most even distribution of rain? 2. Estimate the greatest length of New Zealand. Compare it with a line extending from New Orleans northward. 3. Estimate the distance from Batavia to Manila. 4. Write your impression of the climate of Melbourne in January; in July. 5. Through some fruit dealer obtain a cocoanut in its husk, and examine it. 6. Read Whittier's poem on the Palm Tree. 7. Learn something about the work of missionaries in the small Pacific islands. 8. Collect pictures for the school, showing the Pacific islands and their life. 9. By what routes can one go from New York City to Australia? Through what waters? Which route is the shortest? About how many miles shorter? 10. Answer the same questions for a voyage from New York to Manila. 11. Read in Tarr's "Elementary Geology" (pp. 251–256) about the origin of atolls. 12. Read about the eruption of Krakatoa (same book, p. 343) in the Sunda Strait, near Batavia.

PART VI. REVIEW OF UNITED STATES AND COMPARISONS WITH OTHER COUNTRIES *

Area and population

IN spite of the vast extent of the United States, there are four empires in the Old World with a greater *area*. Which are they (Fig. 531)? Which country is fifth in size? Sixth? Compare the United States with each of these in area.

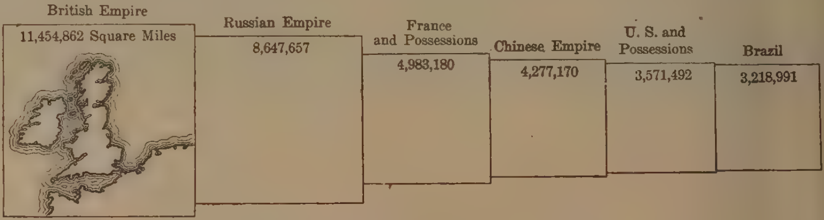

FIG. 531. — Areas of six largest nations (1910).

The United States ranks fourth in *population* (Fig. 532). Name the six most populous countries in the order of their rank. Figure 534 shows the *density of population*, or the number of people per square mile, in some of the countries in the world. From this it will be seen that the United States is very thinly settled, compared with many countries. Compare the United States in this regard with Belgium, England, Cuba, Mexico, and Canada.

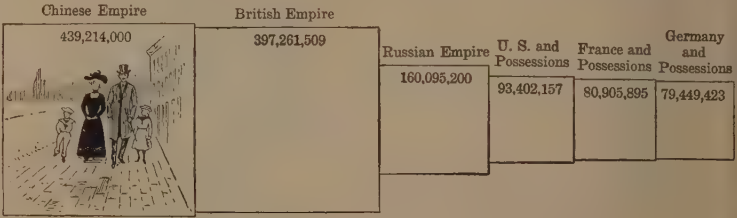

FIG. 532. — Population of six most populous nations (1910).

Density of population in several countries

Surface features

Name and locate the principal mountain systems in the United States; the chief ranges in the West. Describe the drainage of the United States. Name and locate our principal rivers. Which continent has its principal mountains arranged most like those of North America? Show this. How does the arrangement of mountains in North America compare with that of Europe? Compare the surface of the United States with that of European Russia (p. 302); of Brazil (p. 243); of China (p. 361).

Climate

What is the latitude of the northern and of the southern boundary of the United States? Compare the latitude of our country with that of the British Isles (Fig. 2); with that of Germany, Italy, Egypt, India, China, Argentina, Australia.

How do ocean currents affect the temperature of the eastern part of our country? Of the western part (p. 222)? Compare our temperature with that of countries in Europe having most nearly the same latitude (p. 260). Why the difference (p. 261)?

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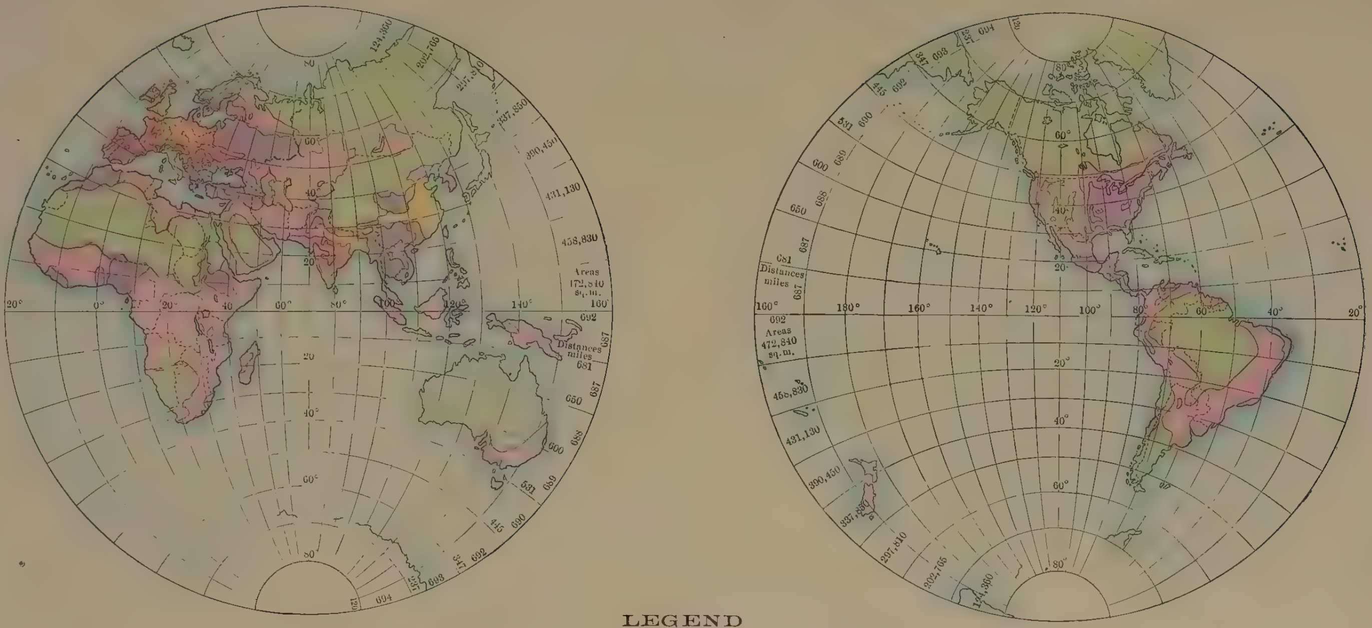
* The statistics in the figures of this section are for 1910.

DISTRIBUTION OF PEOPLE IN THE WORLD



LEGEND

Grade of Peopling	Colored thus	People to one square mile
Very dense	🟨	250 *or more*
Dense	🟧	125 *to* 250
Moderate	🟪	26 *to* 125
Thin	🟥	2½ *to* 26
Scanty	🟩	*Less than* 2½

Compiled by Prof. Mark Jefferson

FIG. 533.

Tell about the prevailing winds and the rainfall in western United States (p. 211); the cyclonic storms and their effects (p. 214); the prevailing winds of Europe (p. 261); the rainfall there, with reasons (p. 217). In what respects are North America and Europe alike in regard to winds and rain?

Native plants and animals

What about native plants and animals in the northern part of North America (p. 13)? In the arid part of the United States (p. 16)? In other parts of the United States (p. 17)? In tropical North America (p. 19)? Compare the native plants and animals of North America with those of South America (p. 239); Africa (p. 376); Asia (p. 343); Australia (p. 391).

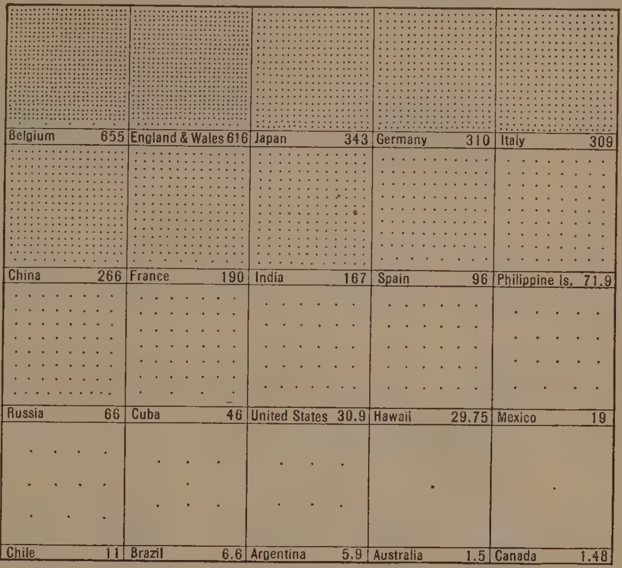


FIG. 534. — Density of population of some of the countries of the world (1910).

Raw food products

1. Corn

In spite of the fact that some nations are larger and more densely settled, the United States leads the world in many very important respects, and approaches leadership in several others. Figure 535 shows that no nation is a close rival to us in the area of *corn*-production. What countries, however, raise large quantities of it? Why is no corn raised in the British Isles (p. 265)?

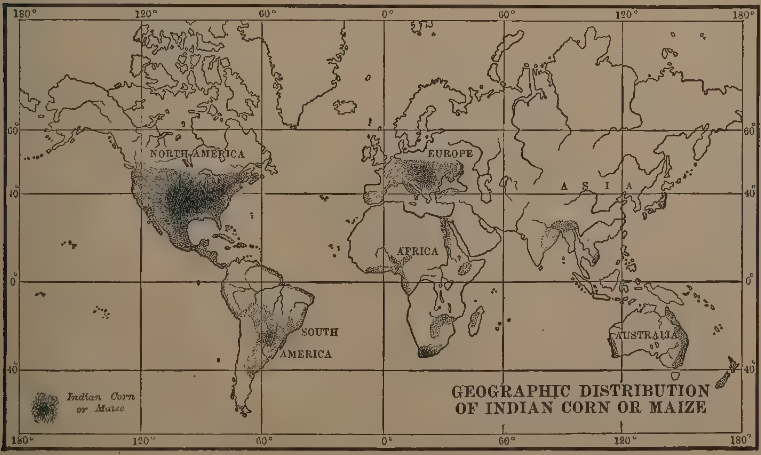


FIG. 535. — Corn sections of the world.

2. Wheat

Wheat is more widely cultivated than corn (Fig. 536). We rank second in the production of that grain. Point out (Fig. 536) the leading wheat fields of the world. Which sections are important for both wheat and corn? On which side of the Atlantic is wheat raised farthest north? Why (p. 223)? Name in order the six countries that lead in the production of this grain (Fig. 537).

3. Sugar cane and sugar beets

Note what sections of the world raise *sugar cane* and *sugar beets* (Fig. 538). Name countries and islands engaged in these industries. Is it mainly the sugar beet or sugar cane that is raised in Europe? Why (p. 313)? What is our rank in the raising of sugar cane and sugar beets (Fig. 538)? Name the six regions that lead in this kind of agriculture.

4. Rice

Figure 540 shows the principal *rice* sections of the world. What continent grows by far the largest amount? What coun-

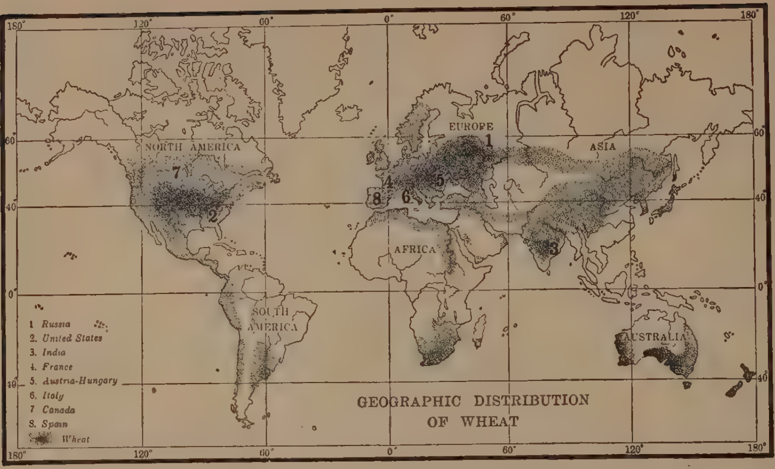


FIG. 536. — Wheat sections of the world.

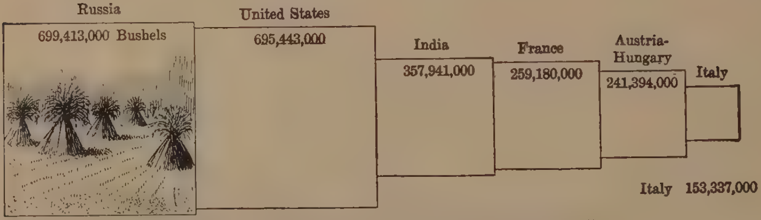


FIG. 537. — Six leading wheat-producing countries (1910).

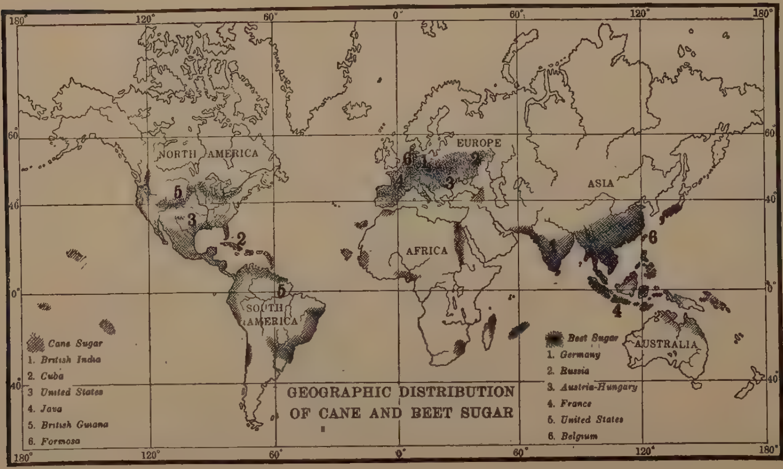


FIG. 538. — Sugar cane and sugar beet sections of the world.

tries in that continent? What other parts of the world produce much of it? What parts of the United States? What climate does it require, and how is it raised (p. 76)?

5. Coffee

Figure 541 shows that coffee is not grown within our states, although in almost every household it is used every day. Notice, however, that it is produced in Cuba, Porto Rico, and the Philippine Islands (Fig. 541). To what climate and countries is it confined? State the rank of the principal coffee-producing sections, and compare their output (Fig. 542).

6. Tea

Our *tea*, also, comes almost entirely from abroad. Mainly from what parts of the

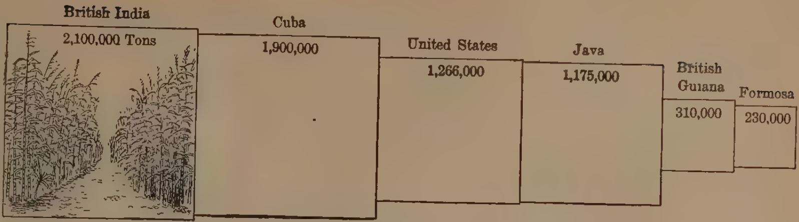


FIG. 539. — The six countries producing the most cane sugar (1910).

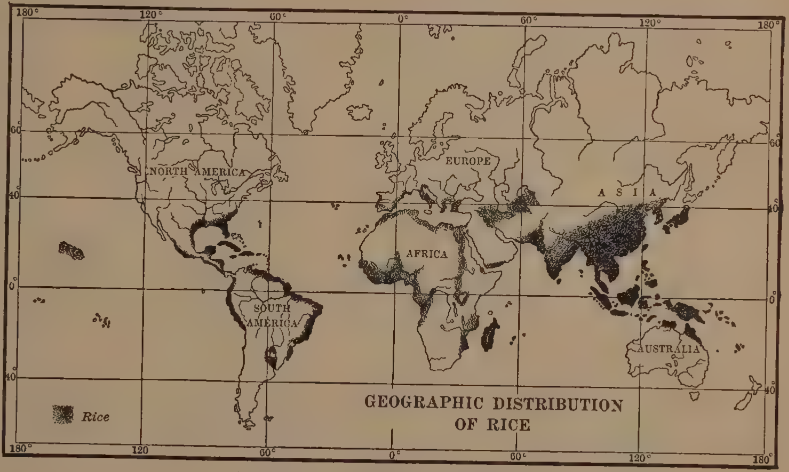


FIG. 540. — Rice sections of the world.

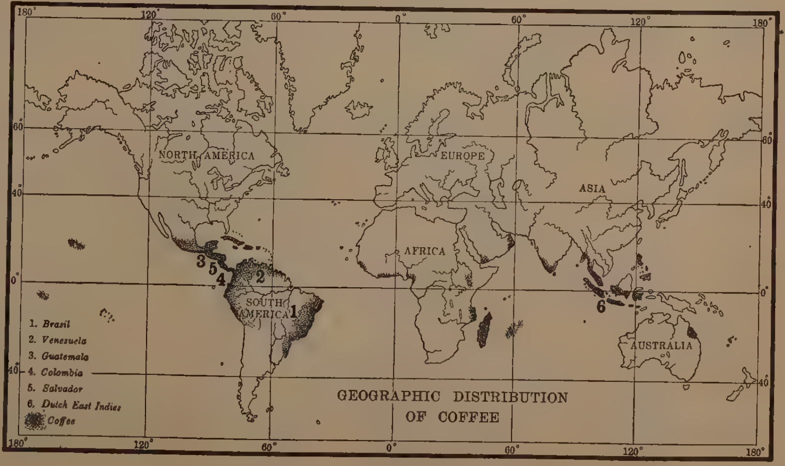


FIG. 541. — Coffee-producing sections of the world.

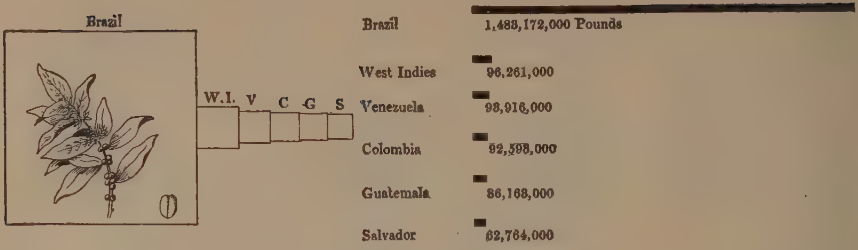


FIG. 542. — Leading coffee-producing countries (1910).

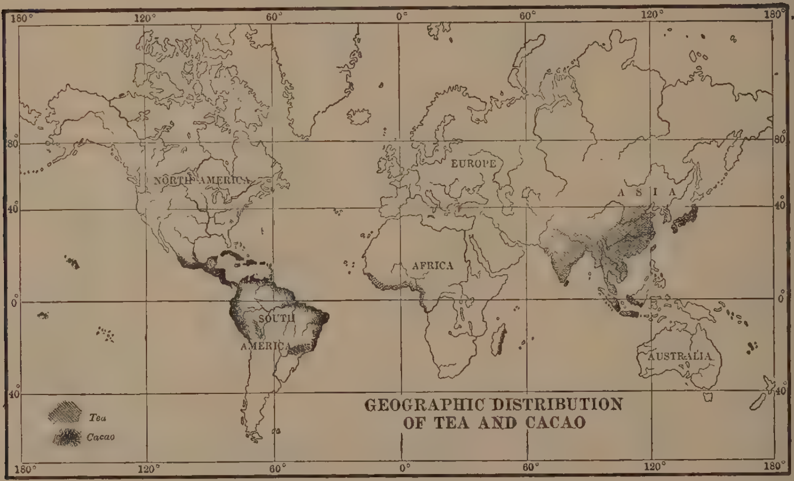


FIG. 543. — Tea and cocoa producing sections of the world.

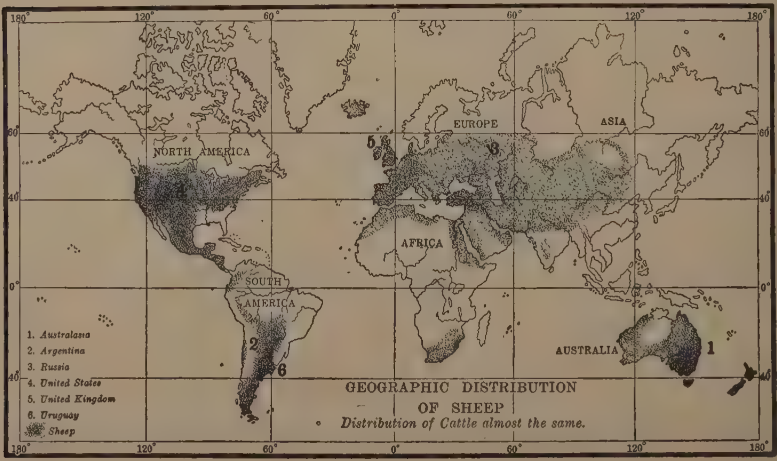


FIG. 544. — Cattle and sheep sections of the world.

world? Name the principal countries and islands.

7. Meat

Note the distribution of *cattle* and *sheep* (Fig. 544). What countries are included? Recall some facts concerning sheep raising in Australia, Argentina, and the United States. Why are cattle and sheep raised in the same regions?

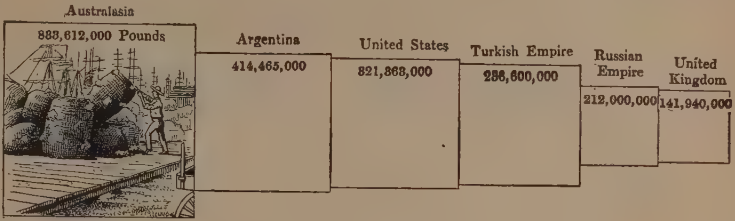


FIG. 545. — The six leading wool-producing countries (1910).

Raw textile products

1. Wool

Figure 545 shows the six leading *wool*-producing countries. Name them. What is the rank of the United States?

2. Cotton

Cotton is limited to warm climates, so that fewer countries raise it. Name the principal sections (Fig. 546). Within what parallels of latitude are they found? Name the five countries that lead in its production (Fig. 547). How much greater is the output of the United States than that of the five other countries together?

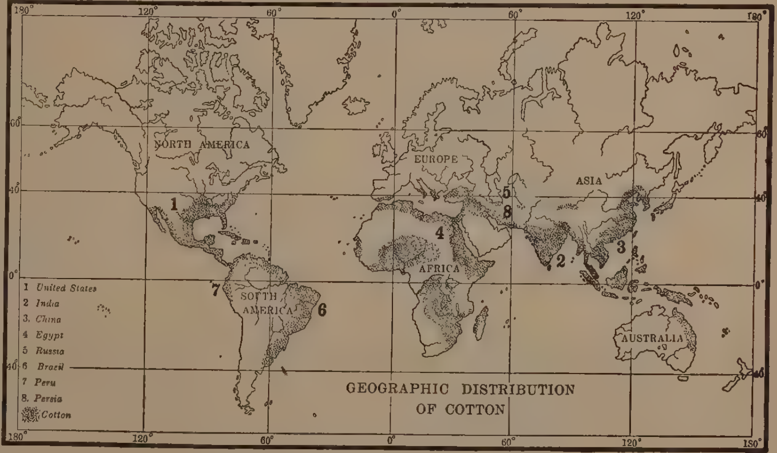


FIG. 546. — The cotton sections of the world.

3. Raw silk

Figure 548 shows the sections that produce silk. What are their names? What about this industry in the United States? Name the countries, in order, that produce most raw silk (Fig. 549). Recall how the work is carried on (p. 286).

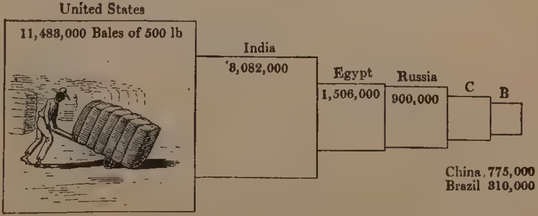


FIG. 547. — The six leading cotton-producing countries (1910).

Mineral products

1. Coal

The great importance of *coal and iron for use in manufacturing* has often been pointed out. Figure 550 shows that the *coal fields* are very limited. What countries have little or no coal? Name the leading coal-producing sections, and state the rank of the United States in the production of this mineral (Fig. 551).

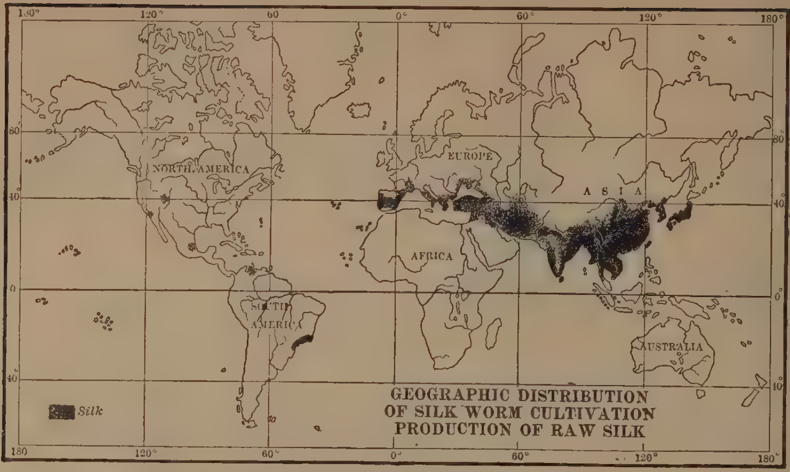


FIG. 548. — The raw-silk-producing sections of the world.

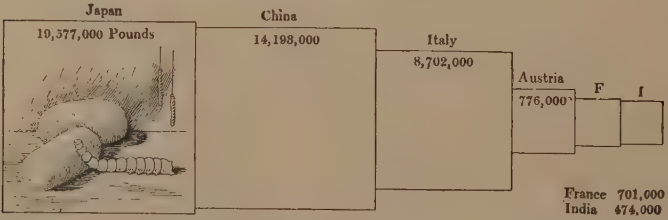


FIG. 549. — The six leading raw-silk-producing countries (1910).

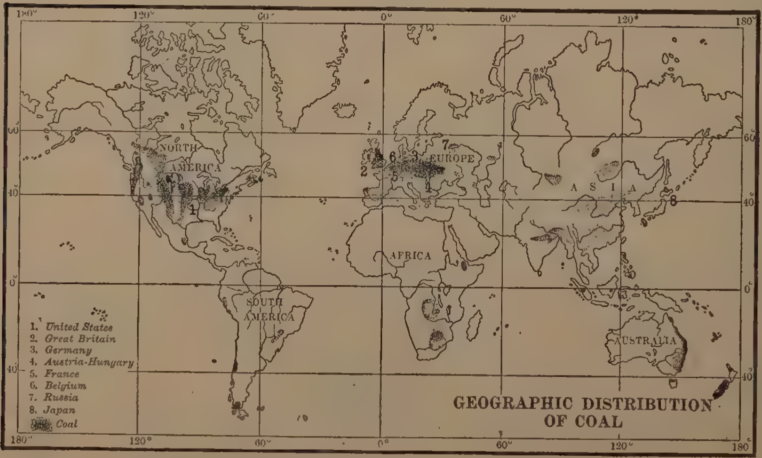


FIG. 550. — Leading coal-producing sections of the world.

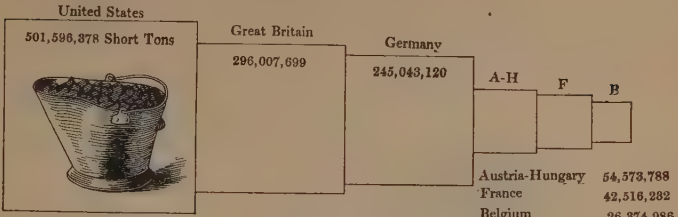


FIG. 551. — The six leading coal-producing countries (1910).

2. Petroleum

The United States leads the world in the production of *petroleum*, or mineral oil (Fig. 552). The second most important district is in Russia, near the Caspian Sea. Other districts produce little petroleum. What are its uses?

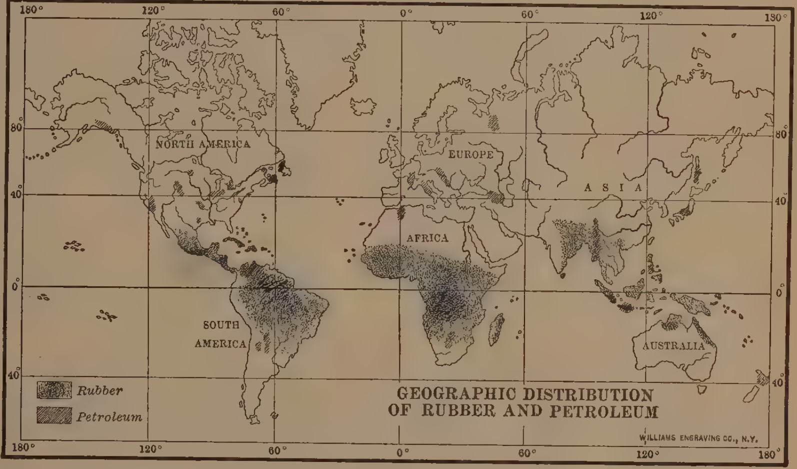


FIG. 552. — The leading petroleum-producing sections of the world.

3. Iron ore and pig iron

Is *iron ore* more or less widely distributed than coal (Fig. 553)? How does the United States rank in the output of this mineral (Fig. 554)? How does the output of coal and iron correspond to the importance of countries as manufacturing nations (Fig. 560)?

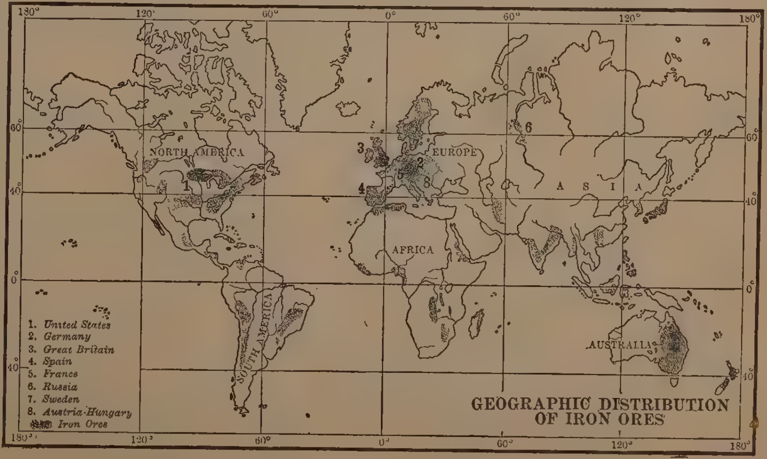


FIG. 553. — Leading sections of the world that produce iron ore.

4. The precious metals

Tell about the distribution of *gold* (Fig. 555), and give our rank in the production of that metal (Fig. 556). Where are the principal *silver*-

mining sections (Fig. 557)? How does the United States compare with other countries in this product (Fig. 558)? Notice to what extent the world is indebted to the New World for silver. How does the value of the total silver production compare with that of gold in the five leading regions for each?

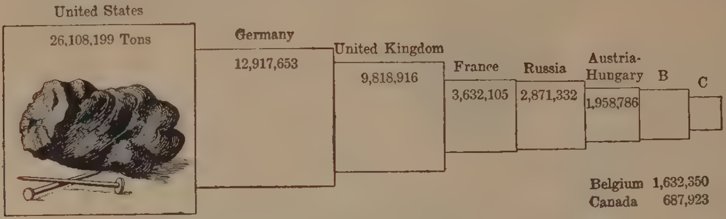


FIG. 554. — The eight leading pig-iron-producing countries (1910).

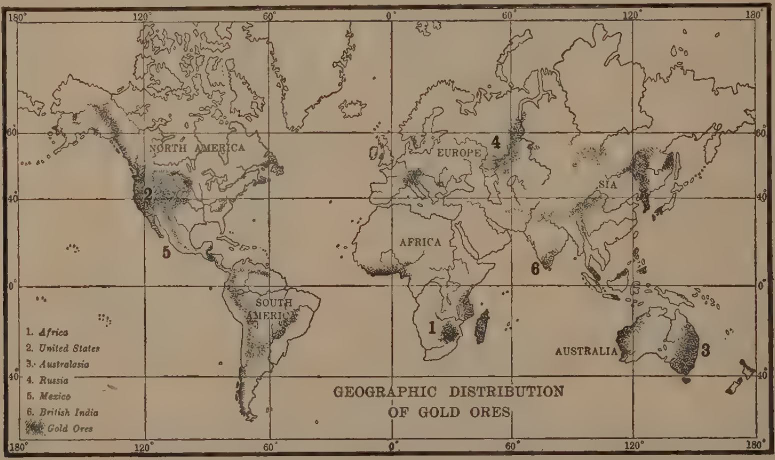


FIG. 555. — Leading gold-producing sections of the world.

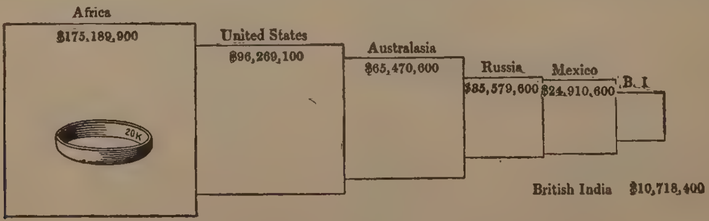


FIG. 556. — The six leading gold-producing countries (1910).

5. Other mineral products

The United States produces great quantities of other minerals. Name some of them (pp. 105 and 106). In the production of some, such as copper and natural gas, our country also leads.

Manufacturing

According to Figure 559, what two continents lead in *manufacturing?* What other smaller sections are active in this industry? Taking into account

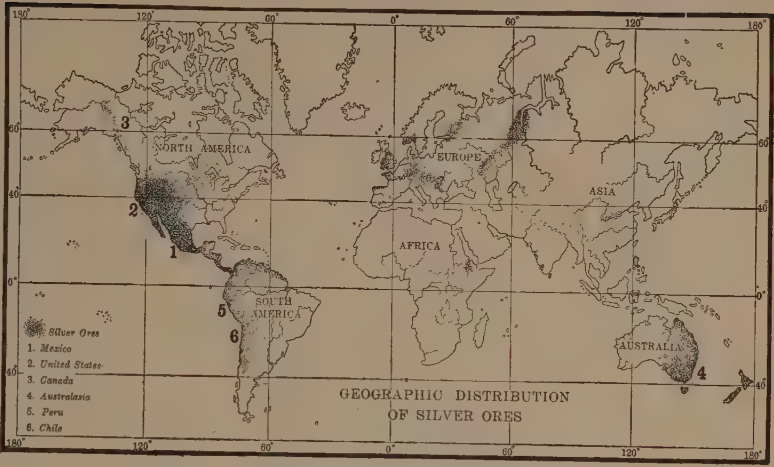


FIG. 557. — Leading silver-producing sections of the world.

the size of our country, the abundance of our raw materials, and the energy and intelligence of our people, it is not surprising that we surpass all other countries in such work (Fig. 560). State the rank of other leading nations in this occupation.

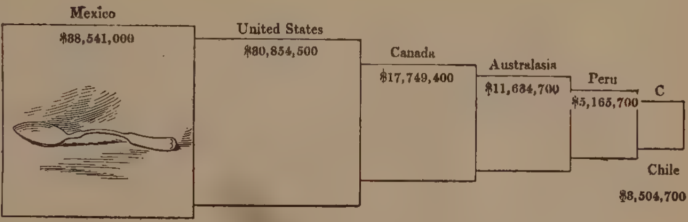


FIG. 558. — The six leading silver-producing countries (1910).

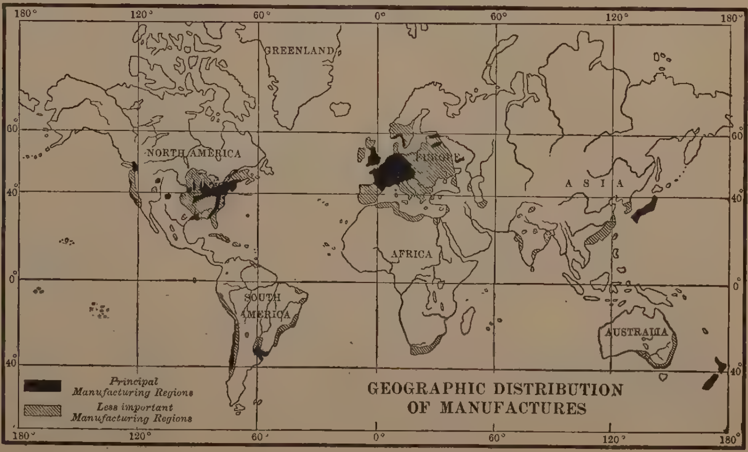

180°
120°
60°
0°
60°
120°
180°
60
40
0°
40
GREENLAND
NORTH AMERICA
SOUTH AMERICA
EUROPE
ASIA
AFRICA
AUSTRALIA
Principal Manufacturing Regions
Less important Manufacturing Regions
GEOGRAPHIC DISTRIBUTION OF MANUFACTURES

FIG. 559. — Manufacturing sections of the world.

Into what articles is corn manufactured in the United States (p. 95)? Where (p. 96)? Answer the same questions about wheat (p. 106). What are the leading centers for the preparation of meats in the United States (p. 109)? What countries in South America are extensively engaged in this industry (pp. 246 and 247)? In what parts of the United States is most cotton manufacturing carried on (p. 82)? Why there? What other countries have much cotton manufacturing? What countries of the world are noted for the manufacture of pig iron and other iron and steel goods? Name great centers for this industry in our own country; in foreign countries.

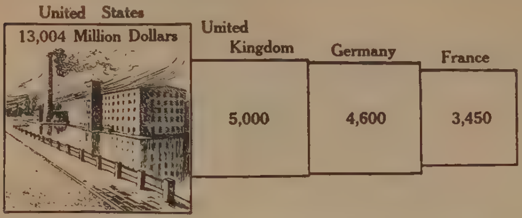


FIG. 560. — The four leading manufacturing countries.

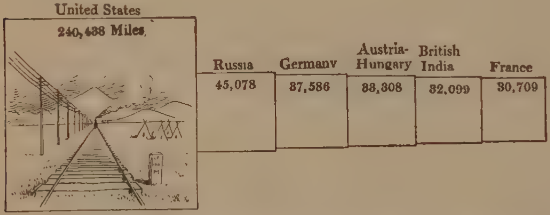


FIG. 561. — The six countries having greatest length of railways (1910).

Commerce

1. Conveniences for transportation

In provision for transportation by rail the United States also takes the leading place. It has a far greater number of miles of railway than any other nation (Fig. 561); but several small European nations have a greater number of miles in proportion to their area.

The United States ranks second in provision for *transportation by water* (Fig. 562). State the rank of the five chief countries in total length of *railways*, and in *merchant marine*. Give reasons why the United Kingdom should lead in merchant marine (p. 275). Why should Norway be of importance in this respect (p. 297)?

2. Our trade with foreign countries

(1) ***Our exports***

We produce many more raw products and manufacture many more goods than we can use. These we send abroad, or *export*, to other countries, and for that reason they are called our *exports*. Our ten leading exports, named in order of value, together with the principal countries to which the goods are sent, are as follows: —

PRINCIPAL EXPORTS OF THE UNITED STATES DURING THE FISCAL YEAR ENDED JUNE 30, 1911

Articles	Value	Principal Countries to which they are sent
1. Cotton (mainly unmanufactured)	$626,170,787	United Kingdom, Germany, France, Italy.
2. Breadstuffs (wheat, corn, flour, etc.)	107,388,698	United Kingdom, Germany, Belgium, Netherlands.
3. Meat and dairy products	132,671,336	United Kingdom, Germany, Belgium, France.
4. Iron and steel, and manufactures of	230,725,351	Canada, Mexico, Japan, United Kingdom.
5. Mineral oils (crude and refined)	98,115,516	United Kingdom, Germany, China, Netherlands.
6. Copper, and manufactures of	104,908,406	Netherlands, Germany, United Kingdom, France.
7. Wood, and manufactures of	92,255,951	United Kingdom, Canada, Mexico, Argentina.
8. Leather, and manufactures of	55,673,057	United Kingdom, West Indies, Mexico, Canada.
9. Tobacco, and manufactures of	43,638,904	Canada, Mexico, West Indies.
10. Coal	45,013,436	United Kingdom, Italy, Germany, France.
Total value of exports (merchandise)	$1,536,561,442	

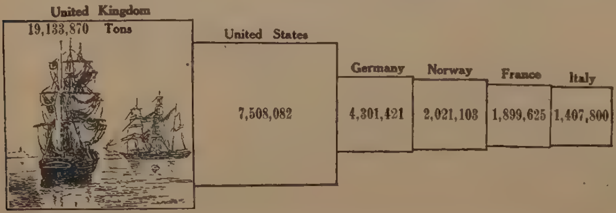


FIG. 562. — The six countries having the largest merchant marine (1910).

Name from memory our principal exports in the order of their value.

While there is thus an enormous quantity of goods that we *sell* to other countries, we must also *buy* many other things. One of these is coffee, as shown in Figure 542; we

(2) *Our imports*

produce far less sugar each year than we consume; we depend wholly on foreign nations for raw silk (Fig. 549); our tea comes almost entirely from abroad (Fig. 543); and while much rice is produced in our Southern States, a large amount has to be purchased. These goods, and many others, have to be brought to our shores, or *imported*, from other countries, and for that reason they are called our *imports*.

Our ten leading imports, named in order of value, together with the principal countries from which they come, are as follows: —

Principal Imports of the United States during the Fiscal Year ended June 30, 1911

Articles	Value	Some of the Principal Countries from which they come
1. Silk, and manufactures of	$106,824,058	Japan, France, Italy, China.
2. Fibers, and manufactures of	85,578,249	Mexico, East Indies, Philippines.
3. Sugar	96,691,096	Cuba, East Indies, Germany (beet sugar).
4. Chemicals, drugs, and dyes	95,101,006	Germany, United Kingdom, France.
5. Cotton, and manufactures of	91,772,871	United Kingdom, Germany, France, Switzerland.
6. Coffee	90,567,788	Brazil, Cent. America, Venezuela, Colombia, Mexico.
7. Hides and skins	70,504,980	East Indies, United Kingdom, Russia, Argentina, Mexico.
8. Wood, and manufactures of	52,931,803	Canada, Sweden, Germany.
9. Wool, and manufactures of	41,797,796	United Kingdom, Australia, France, Germany.
10. India rubber and gutta-percha	92,910,513	Brazil, Mexico.
Total value of imports (merchandise)	$824,620,160	

Compare the value and nature of our exports and imports. How is the result encouraging in comparison with statistics of other countries given in the table below?

The Ten Leading Countries with which we Trade

Countries		Value for Year ended June 30, 1911	Some of the Principal Exports and Imports
1. United Kingdom	Exports	$576,613,974	Cotton, breadstuffs, meat and dairy products, mineral oil.
	Imports	261,289,106	Cotton goods, wool and woolen goods, tin, manufactured fibers.
	Total	837,903,080	
2. Germany	Exports	287,495,814	Cotton, breadstuffs, meat and dairy products, copper, mineral oils.
	Imports	163,242,560	Chemicals and drugs, beet sugar, toys, cotton goods, paper, silk goods.
	Total	450,738,374	
3. Canada	Exports	269,806,013	Iron manufactures, coal, cotton goods.
	Imports	100,863,418	Lumber, wood pulp, fish, copper, hides.
	Total	270,669,431	
4. France	Exports	135,271,648	Cotton, copper, mineral oils, tobacco.
	Imports	115,414,784	Silk goods, woolen goods, cotton goods, wines.
	Total	250,686,432	
5. Cuba	Exports	60,709,062	Breadstuffs, machinery, cotton goods, leather goods, meat and dairy products.
	Imports	110,309,468	Sugar, tobacco, iron ore, fruits.
	Total	171,018,530	
6. Netherlands	Exports	96,103,376	Breadstuffs, meat and dairy products, copper, mineral oils.
	Imports	32,926,492	Tobacco, diamonds
	Total	129,029,868	
7. Brazil	Exports	27,240,146	Machinery, breadstuffs, mineral oils, scientific instruments.
	Imports	100,867,184	Coffee, rubber, cocoa, hides.
	Total	128,107,330	
8. Mexico	Exports	61,281,715	Iron goods, leather goods, coal.
	Imports	57,450,111	Fibers, copper, lead ore, coffee, hides.
	Total	118,731,826	
9. Japan	Exports	36,721,409	Cotton, machinery, mineral oils, breadstuffs.
	Imports	78,527,496	Silk, tea, rice.
	Total	115,248,905	
10. Italy	Exports	60,580,766	Cotton, tobacco, breadstuffs.
	Imports	47,334,809	Silk, fruits, olive oil.
	Total	107,915,575	

More than one third of all our foreign trade is, as you can see, with the British Isles.

3. Principal transportation routes on the oceans

Figure 563 shows the ocean routes that vessels engaged in the commerce between nations generally take between the United States and Europe. To what European countries do they extend? Trace other routes across the Atlantic, and tell what countries they connect. Name some goods that are carried in each case, if you can. Do the same for the Pacific.

4. The dependence of nations upon one another

Our many exports and imports show how dependent we are upon other countries. We are wonderfully favored in the abundance of our resources. Yet it would be of no use to produce so many things if foreign countries did not buy some of them. Again, although we have so many products, there are still many things that we need from other lands. It is true that we probably could depend upon ourselves for all that we want better than any other nation. The English, for instance, would starve within a few weeks, if no food were imported there. Yet note the things that we import. How do they compare, in value, with our exports? Thus, in spite of our great resources, we are really very dependent upon other countries.

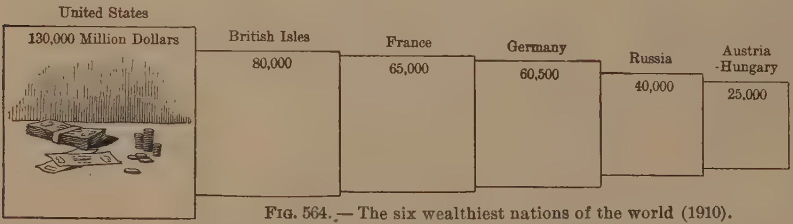


FIG. 564.—The six wealthiest nations of the world (1910).

Owing to our trade relations with the United Kingdom, what hardships would probably be brought upon the British if they entered upon a war with us? How might the Germans suffer if they were at war with us? How might the French suffer? On the other hand, what hardships would come to us in each case?

Wealth of nations

All the preceding facts prepare us for Figure 564, which shows that the United States is the *wealthiest nation* on the face of the earth. Compare our wealth with that of other leading countries.

The figures and diagrams that you have studied show that several European countries compete actively with the United States in the *world's trade*. Give examples.

Reasons why we promise great progress in the future

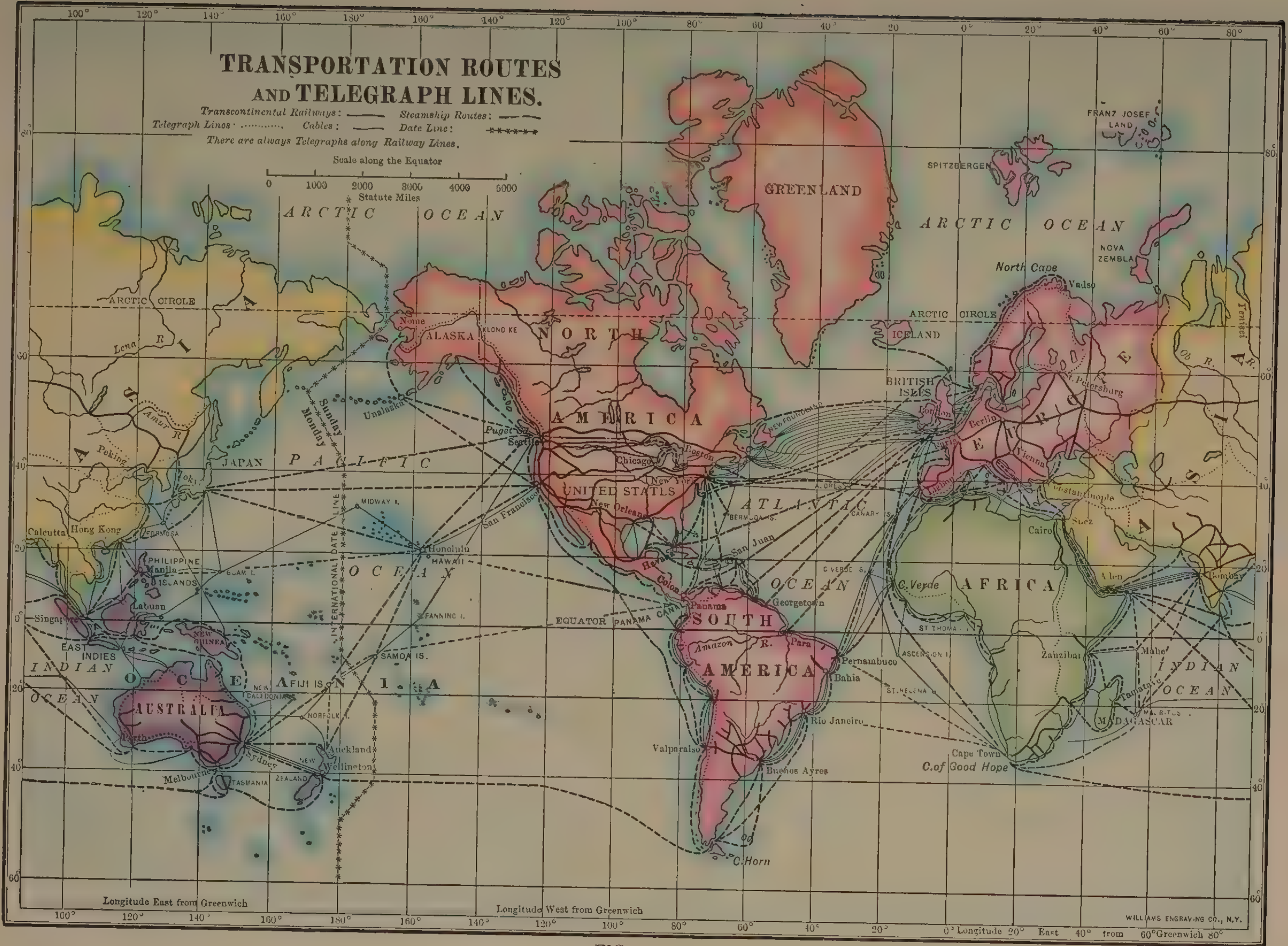
1 and 2. Our youthfulness and abundance of room

So far as the future is concerned, however, several important facts are in our favor. In the first place, we are still in our youth as a people, while some of the leading nations of Europe have, perhaps, already reached the height of their power. In the second place, the territory of most of those countries is densely settled, as shown in Figure 534. Note the number of inhabitants per square mile in Belgium, Germany, and France. When we contrast with these figures our average of only thirty persons per square mile, our possible future growth seems almost without limit. Immense tracts of land, which in Europe would be carefully tilled, are in our country not even cleared for pasture. In no large section of the United States do we even approach the careful tillage of the soil by hand that is common in Belgium and some other European countries.

3. Our variety of climate and surface features

The varied climate and surface features of our vast country are also favorable to us; for they guarantee a variety of products. Almost all farm products can be easily raised, and our wonderful mineral resources are, so far as we know, not equaled on any continent. It will therefore be seen that our natural resources, which have been so important in giving us our present position, promise equally well for the future.

The character of our people is another thing that must be considered in reckoning



TRANSPORTATION ROUTES AND TELEGRAPH LINES.
Transcontinental Railways:
Steamship Routes:
Telegraph Lines:
Cables:
Date Line:
There are always Telegraphs along Railway Lines.
Scale along the Equator
0 1000 2000 3000 4000 5000
Statute Miles
ARCTIC OCEAN
ARCTIC CIRCLE
FRANZ JOSEF LAND
SPITZBERGEN
GREENLAND
NOVA ZEMBLA
North Cape
Vadso
ICELAND
BRITISH ISLES
London
Paris
Berlin
Vienna
St. Petersburg
Lisbon
Constantinople
EUROPE
ASIA
Yenisei
Ob R.
Lena R.
Amur R.
Peking
Tokio
JAPAN
Hong Kong
Calcutta
FORMOSA
PHILIPPINE ISLANDS
Manila
GUAM I.
Labuan
Singapore
EAST INDIES
NEW GUINEA
INDIAN OCEAN
OCEANIA
AUSTRALIA
Perth
Melbourne
Sydney
TASMANIA
NEW CALEDONIA
NORFOLK I.
FIJI IS.
NEW ZEALAND
Auckland
Wellington
SAMOA IS.
FANNING I.
MIDWAY I.
Honolulu
HAWAII
INTERNATIONAL DATE LINE
Sunday
Monday
Unalaska
Nome
ALASKA
KLONDIKE
NORTH AMERICA
PACIFIC OCEAN
Puget Sd.
Seattle
San Francisco
UNITED STATES
Chicago
New York
Boston
New Orleans
NEW FOUNDLAND
BERMUDAS.
AZORES
CANARY IS.
Havana
San Juan
Colon
Panama
PANAMA CANAL
EQUATOR
ATLANTIC OCEAN
C. VERDE S.
C. Verde
Georgetown
SOUTH AMERICA
Amazon R.
Para
Pernambuco
Bahia
Rio Janeiro
Valparaiso
Buenos Ayres
C. Horn
ST THOMA
ASCENSION I.
ST. HELENA
AFRICA
Cairo
Suez
Aden
Bombay
Zanzibar
Mahe
Tamatave
MADAGASCAR
MAURITIUS
Cape Town
C. of Good Hope
Longitude East from Greenwich
Longitude West from Greenwich
0° Longitude 20° East 40° from 60° Greenwich 80°
WILLIAMS ENGRAVING CO., N.Y.

FIG. 563.

our future promise. The condition of China shows that resources alone will not make an energetic people and a great nation; for, in spite of the fact that they have been greatly favored in their resources, they have made very little use of them. Indeed, their customs have even prevented progress (p. 363).

4. The character of our people

Our people have consisted, in large part, of persons who had energy and ambition enough to migrate to a new land in the hope of bettering their condition. In their new home the opportunities have been so great that they have been encouraged to work and to improve themselves. The conditions in the desert have produced the nomad; the ease of life in the tropical forest the shiftless savage; but the conditions in the United States have produced a race noted for its energy and enterprise. This race has been possible, however, largely because it comes from a mixture of peoples already gifted.

5 and 6. Our care for education, and our government

The statement of reasons for expecting great future progress in the United States would not be complete, if left here. There are two other factors of great importance; namely, education and government. Where people are ignorant, and where rulers hamper them by bad laws and heavy taxes, there is little chance of progress. It is those European countries in which there are the best opportunities for education, and the greatest freedom, that have made the greatest progress.

No nation in the world pays more attention to education or guarantees its people a more active part in their government than the United States. These facts, even as fully as the resources and the character of the people, help to explain our astonishing progress in the past, and to give reason for hope in the future.

APPENDIX

REFERENCES TO BOOKS AND ARTICLES

KEY TO ABBREVIATIONS

PUBLISHING HOUSES. — American Book Co., New York (A.B.C.); D. Appleton & Co., New York (App.); The Century Co., New York (Cent.); Doubleday, Page & Co., New York (Doub.); E. P. Dutton & Co., New York (Dutt.); Educational Publishing Co., Boston (E.P.C.); The Ginn Co., Boston (Ginn); Harper & Bros., New York (H.B.); Houghton, Mifflin Co., Boston (H.M.C.); J. B. Lippincott Co., Philadelphia (Lipp.); Longmans, Green & Co., New York (L.G.); The Macmillan Co., New York (McM.); G. P. Putnam's Sons, New York (Put.); Rand, McNally & Co., Chicago (R.McN.); Charles Scribner's Sons, New York (Scrib.); Silver, Burdett & Co., New York (S.B.C.).

MAGAZINES. — *Publications of the Bureau of American Republics*, Washington, D.C. (*B. Amer. R.*); *Journal of School Geography*, until 1902 (*J.S.G.*), beginning 1902, *Journal of Geography* (*J.G.*, $0.15 a number, $1.00 a year; Madison, Wis.); *National Geographic Magazine* ($0.25 a number, $2.50 a year; including membership to Society), Washington, D.C. (*N.G.M.*).

GENERAL. — Many of the references in the First Book would serve for this volume also. It is not, of course, expected that schools will find it possible to obtain all or even a large proportion of those mentioned. These lists, which could easily be multiplied to many times their present size, are offered merely as suggestions to aid those teachers who wish to have a good working library. Many good books are omitted from them, either because of their cost or for other reasons. At the end of each section of Mill's "International Geography" are references to good standard books. See also Mill, "Hints to Teachers and Students on the Choice of Geographical Books" (Longmans, Green & Co., New York, $1.25).

Among the many valuable but expensive books of reference mention may be made of Réclus, "The Earth and its Inhabitants" (App., 19 vols., $5.00 each); Stanford, "Compendiums of Geography" (Scrib., 10 vols., $5.50 each); and Baedeker, "Guide Books" (Scrib., prices variable). The latter may be found in the libraries of friends who have traveled abroad.

There are a number of series for young people which contain good material. For example, Butterworth, "Zigzag Journey Series" (Dana Estes & Co., Boston, 18 vols., $1.50 each); Carpenter, "Geographical Readers" (A.B.C., 6 vols., $0.60 each); Carroll, "Around the World Series" (S.B.C., 6 vols., $0.60 each); Chamberlain, "Home and World Series" (McM., 4 vols., $0.40 each); Champney, "Three Vassar Girls Series" (Dana Estes & Co., Boston, 11 vols., $0.75 each); Hale, "Family Flight Series" (Lothrop Pub. Co., Boston, 5 vols., $1.50 each); "Highways and Byways Series" (McM., 30 vols., $2.00 each); Knox, "Boy Traveler Series" (H.B., 15 vols., $2.00 each); "Peeps at Many Lands Series" (McM., 30 vols., $0.75 each); Pratt, "People and Places, Here and There" (E.P.C., 5 vols., $0.40 each); "List of Books of Travel in European Countries" (*J.G.*, Dec., '07: 173).

Every teacher of geography would find Mill's "International Geography" (App., $3.50) and "The Statesman's Year Book" (McM., $3.00) of inestimable value. For physiography and climate see Tarr, "New Physical Geography" (McM., $1.00). Every teacher ought to have access to at least one of the geographical magazines, and the subscription price is so low that they are accessible to all. Notice how frequently the *National Geographical Magazine* and the *Journal of Geography* are referred to in the following lists. Many articles of timely interest appear in *World's Work, Harper's, Scribner's*, and other magazines.

GOVERNMENT PUBLICATIONS. — Almost no reference is made to the many government publications of geographic interest. There are far too many for so brief a list. For instance, the Smithsonian Institution Annual Report usually contains articles on geographic subjects, and the Fish Commission has published many excellent accounts of the different fishing industries. From the Weather Bureau are issued not merely weather maps, but Annual Reports and Monthly Weather Reviews.

Among the publications of the Geological Survey are reports upon Irrigation, Annual Reports containing many excellent accounts of the geology of interesting regions, especially mining regions, and also Annual Reports of the Mineral Resources of the country, with statistics. Besides these, the Geological Survey issues topographic maps (five cents each). A list of these maps can be obtained upon application, and the teacher may find a map of the region where the school is situated.

A great range of topics is covered by the various Annual Reports (called Year Books) and Bulletins of the Department of Agriculture upon such subjects as farming, various crops, forestry, botany, mammals, irrigation, etc. Special reports of importance are issued by the Treasury Department, which also issues Statistical Abstracts on commerce, finance, population, etc. From the State Department, besides valuable special papers (like the Report of the Philippine Commission), are issued the Consular Reports, which have articles and notes upon foreign industries, etc. A wealth of geographical information is contained in the various Census volumes. Besides these, there are other reports, as that on the Precious Metals, issued annually by the Director of the Mint, the Report of the Bureau of Ethnology, and the Report of the Commissioner on Indian Affairs. The maps of the United States Coast Survey will be found of value, especially in those schools located on the coast, which should certainly have maps of their immediate locality. Many states also issue valuable reports on agriculture, mining, manufacturing, etc.

In order to find out about the government publications, one can often obtain a list of those issued by a given bureau by writing to the Superintendent of Public Documents, Washington, D.C. A monthly list of all government publications is also prepared by the Superintendent of Public Documents, thus permitting one to keep track of new publications. Some of the publications must be purchased, but many may be obtained by writing to one's congressman or senator, to whom copies are given for free distribution among constituents. The great majority of government documents are issued for free distribution. Applications for these, in moderation, are invariably granted when needed for schools, provided the quota is not already exhausted.

General. — Adams, "Text-book of Commercial Geography" (App., $1.30); Allen, "Children of the Palm Lands" (E.P.C., $0.50); American Commonwealth Series (volume for each state, H.M.C., $1.25 each); Ballou, "Footprints of Travel" (Ginn, $1.00); Bartholomew, "The Handy Reference Atlas of the World" (Dutt., $2.50); Brigham, "Geographic Influence in American History" (Ginn, $1.25); Brooks, "Century Book for Young Americans" (Cent., $1.50); Carpenter, "How the World is Fed" (A.B.C., $0.60); Carpenter, "Geographical Readers" (one for each continent, A.B.C., $0.60 to $0.70 each); Chase and Clow, "Stories of Industry" (E.P.C., 2 vols., $0.40 each); Colquhoun, "The Mastery of the Pacific" (McM., $3.00); Gannett, "Commercial Geography" (A.B.C., $1.00); Geikie, "The Teaching of Geography" (McM., $0.60); George, "Relations of Geography and History" (Oxford University Press, New York, $1.10); Hammond, "Handy Atlas of the World" (C. S. Hammond Co., New York, $1.00); Herbertson, "Descriptive Geographies from Original Sources" (for each continent, McM., $0.70 to $0.90 each); Herbertson, "Man and His Work" (McM., $0.60); Hurlburt, "Stories about Children of All Nations" (J. C. Winston Co., Philadelphia, $0.75); Johnson, "Mathematical Geography" (A.B.C., $1.00); King, "Picturesque Geographical Readers" (Lee & Shepard, Boston, Vol. 2, $0.72, Vols. 3, 4, and 5, each $0.56); Kirkham, "In the Open" (P. Elder & Co., San Francisco, $1.75); Lummis, "Some Strange Corners of Our Continent" (Cent., $1.50); Lyde, "A School Text-book of Geography" (McM., $1.00); Lyde, "Geographies of the Various Continents" (McM., $0.50 to $1.40); Lyde, "Man and his Markets" (McM., $0.50); McMurry, "Special Method in Geography" (McM., $0.70); McMurry, "Teacher's Manual of Geography" (McM., $0.40); Morris, "Home Life in All Lands" (Lipp., $1.00); Réclus, "The Earth and its Inhabitants," Vols. XV, XVI, and XVII (App., $5.00 each); Reynolds, "World Pictures" (McM., $0.70); Rocheleau, "The Geography of Commerce and Industry" (E.P.C., $1.00); Rocheleau, "Great American Industries" (C. A. Flanagan, Chicago, 2 vols., $0.50 each); Shaler, "Man and the Earth" (Ginn, $1.50); Smith, "Our Own Country" (S.B.C., $0.50); Stanford, "Compendium of Geography and Travel," North America: Vol. 1, "Canada" by Dawson; Vol. 2, "United States" by Gannett (Scrib., $5.50 each); Tarr and McMurry, "Five Book Series" (McM., $0.40 to $0.75 each); Toothaker, "Commercial Raw Materials" (Ginn, $1.25); Trotter, "Geography of Commerce" (McM., $1.10); Austin, "Queer Methods of Travel" (*N.G.M.*, Nov., '07: 687); Fay, "The World's Highest Altitudes" (*N.G.M.*, June, '09: 493); Mill, "The Development of Habitable Lands" (*J.S.G.*, May, '00: 161; and June, '00: 218).

North America. — Carpenter, "Geographical Reader of North America" (A.B.C., $0.60); Herbertson, "Descriptive Geography: North America" (McM., $0.75); Hurlburt, "Historic Highways of North America" (A. H. Clark Co., Cleveland, $2.50); McMurry, "Excursions and Lessons in Home Geography" (McM., $0.50); McMurry, "Larger Types of American Geography" (McM., $0.75); Pratt, "American History Stories" (E.P.C., 4 vols., $0.36 each); Reynolds, "The Americas" (McM., $0.75); Russell, "North America" (App., $2.50); Russell, "Glaciers of North America" (Ginn, $1.75); Russell, "Lakes of North America" (Ginn, $1.50); Russell, "Rivers of North America" (Put., $2.00); Semple, "American History and its Geographic Conditions" (H.M.C., $1.25).

The United States. General. — Adams, "America's Economic Supremacy" (McM., $1.25); Adams, "The New Empire" (McM., $1.50); Austin, "Steps in the Expansion of our Territory" (App., $1.25); Baedeker, "The United States" (Scrib., $3.60); Brigham, "Geographic Influences in American History" (Ginn, $1.25); Brooks, "Century Book of American Colonies" (Cent., $1.50); Brooks, "First across the Continent"

(Scrib., $1.50); Bryce, "American Commonwealth" (McM., $4.00; abridged edition, $1.75); Channing, "Students' History of the United States" (McM., $1.40); Fiske, "How the United States became a Great Nation" (Ginn, $1.25); Gannett, "The Building of a Nation" (H. T. Thomas, Co., New York, $2.50); Hale, "Tarry at Home Travels" (McM., $2.50); King, "Handbook of the United States" (Moses King Corporation, New York, $2.50); MacCoun, "An Historical Geography of the United States" (Townsend MacCoun, New York, $1.00); McMurry, "Type Studies from Geography of the United States" (McM., $0.50); Newell, "Irrigation in the United States" (Crowell & Co., New York, $2.00); "Our Country" (U. L. Mason, New York, $0.50); Patton, "The Natural Resources of the United States" (App., $3.00); Ries, "Economic Geology of the United States" (McM., $2.00); Shaw, "Uncle Sam and His Children" (A. S. Barnes Co., New York, $1.20); Smith, "Our Own Country" (S.B.C., $0.50); Smith, "The Story of Iron and Steel" (App., $0.75); Stevenson, "Across the Plains" (Scrib., $1.25); Stoddard, "Beautiful Scenes of America" (Saalfield Pub. Co., Akron, O., $0.75); Tarr, "Economic Geology of the United States" (McM., $3.50); "The Story of Paper Making" (Butler Paper Co., Chicago, $1.25); Whitney, "The United States" (Little, Brown & Co., Boston, $2.00); Young, "The Cotton Industry" (Scrib., $0.75); Adams, "The United States: Land and Water" (*N.G.M.*, May, '03: 171); Austin, "The United States: Her Industries" (*N.G.M.*, Aug., '03: 301); Kirchhoff, "The United States: Her Mineral Resources" (*N.G.M.*, Sept., '03: 331); Price, "The Influence of Forestry upon the Lumber Industry of the United States" (*N.G.M.*, Oct., '03: 381); "The Growth of the United States" (*N.G.M.*, Sept., '98: 377); Wiley, "The United States: Its Soils and Their Products" (*N.G.M.*, July, '03: 261); Brown, "Seaports in the United States" (*J.G.*, Oct., '05: 337); Emerson, "A Glimpse of Steel Manufacture" (*J.G.*, April, '03: 169).

New England. — Bacon, "Historic Pilgrimages in New England" (S.B.C., $1.50); Davis, "Physical Geography of Southern New England" (A.B.C., $0.20); Drake, "Nooks and Corners of the New England Coast" (H.B., $2.50); Emerson, "New England States" (McM., $0.30); Johnson, "New England and its Neighbors" (McM., $2.00); Kimball, "Vermont for Young Vermonters" (App., $1.00); Kipling, "Captains Courageous" (Cent., $1.50); Thoreau, "Maine Woods" (H.M.C., $1.50); Barton, "General Geographic Features in and around Boston" (*J.G.*, June, '03: 277); Dodge, "Approaching Boston" (*J.G.*, June, '03: 271); Emerson, "Boston, A Center of Industry" (*J.G.*, June, '03: 315); Gulliver, "Geographical Development of Boston" (*J.G.*, June, '03: 323); "Geographical Notes on Boston" (*J.G.*, June, '03: 330); Bibliography of Boston and Vicinity (*J.G.*, June, '03: 333); King, "Excursions in and around Boston" (*J.G.*, June, '03: 286); Shurtleff, "Boston Parks" (*J.G.*, June, '03: 302).

Middle Atlantic States. — Brigham, "From Trail to Railway through the Appalachians" (Ginn, $0.50); Chandler & Foushee, "Virginia" (McM., $0.30); Gilbert, "Niagara Falls and their History" (A.B.C., $0.20); Rupert, "Pennsylvania" (McM., $0.30); Southworth, "Story of the Empire State" (App., $0.75); Twitchell, "Maryland" (McM., $0.30); Whitbeck, "New Jersey" (McM., $0.30); Whitbeck, "New York" (McM., $0.30); Brigham, "The Eastern Gateway of the United States" (*J.S.G.*, April, '00: 127); Dietz, "The Fall Line" (*J.G.*, June, '05: 244).

Southern States. — Barrett, "Tennessee" (McM., $0.30); Brook, "Cotton: Its Uses, Culture, etc." (Spon & Chamberlain, New York, $3.00); Burkett, "Cotton" (Doub., $2.00); Earle, "Southern Agriculture" (McM., $1.25); Faust and Allen, "North Carolina" (McM., $0.30); Hayes, "The Southern Appalachians" (A.B.C., $0.20); Hitchcock, "Louisiana Purchase" (Ginn, $1.25); Hohn, "Cotton Mills in South Carolina" (A. Kohn, Charleston, S.C., $1.00); Littlejohn, "Texas" (McM., $0.35); Mitchell, "Georgia Land and People" (F. L. Mitchell, Atlanta, Ga., $1.25); Ralph, "Dixie, or Southern Scenes and Sketches" (H.B., $2.50); Smith, "Water Resources of Alabama" (E. A. Smith, University of Alabama, Gratis); Taylor and Stephen, "Louisiana" (McM., $0.25); Thompson, "From Cotton Field to the Cotton Mill" (McM., $1.50); Willoughby, "Across the Everglades" (Lipp., $1.50); Harrison, "Cultivation of Rice in the United States" (*J.G.*, Sept., '03: 369); Lloyd, "The Delta of the Mississippi" (*J.G.*, May, '04: 204); Phillips, "How the Mangrove Tree adds New Land to Florida" (*J.G.*, Jan., '03: 10); Series of papers on the Geography of the Louisiana Purchase (*J.G.*, June, '04: 243–278); "The Mississippi River" (*J.G.*, Oct., '02: 374).

Central States. — Bender, "Iowa" (McM., $0.20); Barnard, "Missouri" (McM., $0.30); Condra, "Geography of Nebraska" (University Pub. Co., Lincoln, Neb., $0.90); Cooley, "Michigan" (H.M.C., $1.10); Darling, "Illinois" (McM., $0.30); Dryer, "Studies in Indiana Geography" (Inland Pub. Co., Indianapolis, Ind., $0.50); Fox, "Out Doors in Old Kentucky" (Scrib., $1.75); Grinnell, "Jack, the Young Explorer" (F. A. Stokes, New York, $1.25); Hall, "Geography of Minnesota" (H. W. Nelson Co., Minneapolis, Minn., $1.20); Hovey, "Celebrated American Caverns" (B. Clarke Co., Cincinnati, O., $2.00); Stanchfield, "Lumbering in Minnesota" (D. Stanchfield, Minneapolis, Minn., $1.00); Thwaites, "Down Historic Waterways," "On the Storied Ohio" (McClurg, Chicago, $1.20 each); Willard, "Story of the Prairies" (R.McN., $1.75); Wilson, "Ohio" (McM., $0.30); Winans, "Kansas" (McM., $0.30); Hall, "Minnesota, a Sketch" (*J.G.*, June, '02: 241); Hall, "Minneapolis and its Environs" (*J.G.*, June, '02: 249).

Western States. — Austin, "The Land of Little Rain" (H.M.C., $2.00); Brooks, "First across the Continent" (Scrib., $1.50); Brown, "The Glory Seekers" (McClurg, Chicago, $1.50); Clark, "Indians of the Yosemite Valley and Vicinity" (G. Clark, Yosemite Valley, Cal., $1.00); Cody, "True Tales of the Plains" (Cupples & Leon, New York, $1.00); Fairbanks, "California" (McM., $0.30); Fultz, "Out of Door Studies in Geography" (Public Schools Pub. Co., Bloomington, Ill., $0.60); Grohman, "Camps in the Rockies" (Scrib., $1.25); Hewitt, "Across the Plain and over the Divide" (Broadway Pub. Co., New York, $1.50); Irish, "Arizona" (McM., $0.20); Jones, "Utah" (McM., $0.40); Jordon, "California and the Californians" (A. H. Robertson, San Francisco, Cal., $0.75); Muir, "Our National Parks" (H.M.C., $1.75); Munk, "Arizona Sketches" (Grafton Press, New York, $2.00); Paine, "Greater America" (Outing, New York, $1.50); Parkman, "The Oregon Trail" (Little, Brown & Co., Boston, $2.00); Prudden, "On the Great American Plateau" (Put., $1.50); Ralph, "Our Great West" (H.B., $2.50); "The Pacific Coast Guide Book" (R.McN., $1.00); Tonge, "Handbook of Colorado Resources" (T. Tonge, Denver, Col., $0.50); Van Dyke, "The Desert" (Scrib., $1.25); "Washington" (McM., $0.20); Barrows, "The Colorado Desert" (*N.G.M.*, '00: 337); Blanchard, "Home Making by the Government" (*N.G.M.*, April, '08: 250); Blanchard, "Millions for Moisture" (*N.G.M.*, April, '07: 217); Chapman, "Deserts of Nevada and the Death Valley" (*N.G.M.*, Sept., '06: 483); Chapman, "Our Northern Rockies" (*N.G.M.*, Oct., '02: 361); McGee, "The Yuma Trail" (*N.G.M.*, April, '01: 103); Newell, "The Reclamation of the West" (*N.G.M.*, Jan., '04: 15); Ransome, "The San Francisco Earthquake" (*N.G.M.*, May, '06: 280); Rody, "Arizona and New Mexico" (*N.G.M.*, '06: 101); "The Redwood Forest of the Pacific Coast" (*N.G.M.*, May, '99: 145); Dodge, "Life on the Colorado Plateaus" (*J.S.G.*, Feb., '00: 45); Dodge, "The Big Trees of California" (*J.S.G.*, Jan., '01: 16); Russell, "Climate, Vegetation, and Drainage of Cascade Mountains" (*J.S.G.*, Oct., '01: 280); Lee, "Canyons of Southeastern Colorado" (*J.G.*, Oct., '02: 357); Newell, "Irrigation on the Great Plains" ('96 Year Book, Department of Agriculture, Washington, D.C., p. 197).

Alaska. — Burroughs, "Far and Near" (H.M.C., $1.10); De Windt, "Through the Gold Fields of Alaska to Bering Strait" (H.B., $2.50); Edwards, "Into the Yukon" (R. Clarke Co., Cincinnati, O., $1.50); Greeley, "Alaska" (Scrib., $2.00); Higginson, "Alaska, the Great Country" (McM., $2.50); MacDonald, "The White Trail" (H. M. Caldwell, Boston, $1.25); Scidmore, "Guidebook to Alaska" (App., $1.25); Stoddard, "Over Rocky Mountains to Alaska" (B. Herder, St. Louis, $0.75); Swineford, "Alaska" (R.McN., $1.00); Thompson, "Gold Seeking in the Dalton Trail" (Little, Brown Co., Boston, $1.50); "Alaska" (*N.G.M.*, April, '98: 105, twelve articles); "An Expedition through the Yukon District" (*N.G.M.*, Vol. 2, '92: 117); Brooks, "Geography of Alaska" (*N.G.M.*, May, '04: 213); Gannett, "The General Geography of Alaska" (*N.G.M.*, May, '01: 180); Georgeson, "The Possibilities of Alaska" (*N.G.M.*, March, '02: 81); Grosvenor, "Reindeer in Alaska" (*N.G.M.*, April, '03: 127); "Life on a Yukon Trail" (*N.G.M.*, Oct., '99: 377 and 457); "The Alaskan Boundary" (*N.G.M.*, Nov., '99: 425); Bayley, "The Yukon and its Basin" (*J.G.*, Oct., '08: 25); Brooks, "An Exploration to Mt. McKinley" (*J.G.*, Nov., '03: 441); Davidson, "Glaciers of Alaska" (Geographical Society of the Pacific, San Francisco, Cal.); Brooks, "Geography of Alaska" (United States Geological Survey, Washington).

The Polar Regions. — Baker, "Out of the Northland" (McM., $0.25); Hayes, "The Land of Desolation" (H.B., $1.75); Horton, "The Frozen North" (D. C. Heath, Boston, $0.40); Long, "Northern Trails" (Ginn, $1.50); Nansen, "First Crossing of Greenland" (L.G., $1.25); Mrs. Peary, "The Snow Baby" (F. A. Stokes, New York, $1.30); Mrs. Peary, "Children of the Arctic" (F. A. Stokes, $1.20); Mrs. Peary, "My Arctic Journal" (Contemporary Pub. Co., New York, $2.00); Schwatka, "Children of the Cold" (E.P.C., $1.25); Scott, "From Franklin to Nansen" (Lipp., $1.25); Scott, "Romance of Polar Exploration" (Lipp., $1.50); Smith, "Eskimo Stories" (R.McN., $1.00); "An Ice-wrapped Continent, Antarctica" (*N.G.M.*, Feb., '07: 95); Harris, "Some Indications of Land in the Vicinity of the North Pole" (*N.G.M.*, June, '04: 255); Peary, "The Value of Arctic Exploration" (*N.G.M.*, Dec., '03: 429); "Climatic Control in Greenland" (*J.S.G.*, Oct., '00: 281).

West Indies and Bermuda. — Arthur, "Ten Thousand Miles in a Yacht" (Dutt., $2.00); "Handbooks on Haiti and Santo Domingo" (*B. Amer. R.*, $0.35 each); Hill, "Cuba and Porto Rico" (Cent., $3.00); Kennan, "Tragedy of Pelée" (McM., $1.00); Kingsley, "At Last: A Christmas in the West Indies" (McM., $1.25); Nicholas, "Around the Caribbean and across Panama" (H. M. Caldwell, Boston, $2.00); Ober, "Guide to the West Indies and Bermudas" (Dodd, Mead Co., New York, $2.25); Ober, "Our West Indian Neighbors" (James Pott & Co., $2.50); Prichard, "Where Black rules White" (Scrib., $3.00); Rodway, "The West Indies and the Spanish Main" (Put., $1.75); Stoddard, "Cruising among the Caribbees" (Scrib., $1.50); "The Foreign Commerce of our Possessions," etc. (Treasury Department, Washington); "The United States and Porto Rico" (L.G., $1.30); Chester, "Haiti, a Degenerating Island" (*N.G.M.*, March, '08: 200); "Cuba" (*N.G.M.*, Sept., '98:

193); "Cuba, the Pearl of the Antilles" (*N.G.M.*, Oct., '06: 535); Hill, "Cuba and Porto Rico" (Cent., $3.00); Hill and Russell, "Volcanic Disturbances in the West Indies" (*N.G.M.*, July, '02: 223); "Porto Rico" (*N.G.M.*, March, '99: 93); Russell, "Volcanic Eruptions on Martinique and St. Vincent" (*N.G.M.*, Dec., '02: 415); Wilcox, "Among the Mahogany Forests of Cuba" (*N.G.M.*, July, '08: 485); Cline, "The Island of Porto Rico" (*J.S.G.*, Dec., '01: 362); Heilprin, "The Bermuda Islands" (A. Heilprin, Philadelphia, $3.50).

Hawaiian and Small Islands. — Alexander, "A Brief History of the Hawaiian People" (A.B.C., $1.50); Baldwin, "Geography of the Hawaiian Islands" (A.B.C., $0.60); Dole, "Hiwa: Tale of Ancient Hawaii" (H.B., $1.00); "Greatest America; the Latest Acquired Possessions" (Perry Mason Co., Boston, $0.50); "Report of the Hawaiian Commission" (State Department, Washington); Young, "The Real Hawaii" (Doubleday, New York, $1.50); Wallace, "Island Life" (McM., $1.75); Whitney, "Hawaiian America" (H.B., $2.50); articles on "Samoa" (*N.G.M.*, June, '99: 207).

Philippine Islands. — Conger, "An Ohio Woman in the Philippines" (Mrs. E. B. Conger, Akron, O., $2.00); Coulter, "Nature Study Reader for the Philippine Islands" (App., $0.60); Coursey, "History and Geography of the Philippine Islands" (Educator School Supply Co., Mitchell, S.D., $0.50); Jernegan, "Philippine Geography" (D. C. Heath, Boston, $0.60); Knapp, "Story of the Philippines" (S.B.C., $0.60); Sonnichsen, "Ten Months a Captive among Filipinos" (Jennings & Graham, Cincinnati, $1.75); Worcester, "The Philippine Islands and their People" (McM., $2.50); Younghusband, "The Philippines and Round About" (McM., $2.50); "Report of the Philippine Commission" (State Department, Washington); Articles on the Philippines (*N.G.M.*, June, '98: 257–304; Oct., '99: 33–72; Nov., '00: 1); Barrett, "The Philippine Islands and their Environment" (*N.G.M.*, Jan., '00: 1); Gannett, "The Philippine Islands and their People" (*N.G.M.*, March, '04: 71); Papers on Philippines (*N.G.M.*, May, '03); Sanger and others, "A Revelation of the Filipinos" (*N.G.M.*, April, '05: 139); "The Climate of the Philippine Islands" (*J.S.G.*, Dec., '99: 361).

Canada. — Aner, "The North Country" (R. Clarke Co., Cincinnati, $2.00); Baedeker, "The Dominion of Canada" (Scrib., $1.50); Butler, "Wild Northland, a Winter with a Dog" (A. S. Barnes & Co., New York, $1.00); "Canadian Guide Book" (App., $1.00); Coe, "Our American Neighbors" (S.B.C., $0.60); Hatton and Harvey, "Newfoundland" (Doyle & Whipple, Boston, $2.50); Howe, "Fourteen Thousand Miles, a Carriage, and Two Women" (F. S. Howe, Leominster, Mass., $1.50); Morely, "Down North and Up Along" (Dodd, Mead & Co., New York, $1.50); Parkin, "The Great Dominion" (McM., $1.75); Pauli, "Record of a Trip through Canada's Wilderness" (J. A. Pauli & Co., New York, $1.50); Plummer, "Roy and Ray in Canada" (Henry Holt & Co., New York, $1.75); Ralph, "On Canada's Frontier" (H.B., $2.50); Statistical Year Book (each year by Department of Agriculture, Ottawa); "The Relation of the United States and Canada" (Senate Reports, No. 1530, Washington); Wallace, "Long Labrador Trail" (Outing, New York, $1.50); Willcox, "Exploration in the Canadian Rockies" (*N.G.M.*, May, '02: 151; June, '02: 185).

Mexico. — Baedeker, "The United States" (with an excursion into Mexico; Scrib., $3.60); Bancroft, "Resources and Development of Mexico" (The Bancroft Co., San Francisco, $4.50); Edwards, "On the Mexican Highlands" (Jennings & Graham, Cincinnati, $1.50); Fitzgerrell, "Guide to Tropical Mexico" (J. J. Fitzgerrell, Mexico City, $0.50); "Guide to Mexico" (App., $1.50); Griffin, "Mexico of To-day" (H.B., $1.50); Hornaday, "Camp Fires on Desert and Lava" (Scrib., $3.00); Lummis, "The Awakening of a Nation" (H.B., $2.50); McGary, "An American Girl in Mexico" (Dodd, Mead & Co., New York, $1.00); Noll, "Short History of Mexico" (McClurg & Co., Chicago, $0.75); Plummer, "Roy and Ray in Mexico" (Henry Holt Co., New York, $1.75); Prescott, "Conquest of Mexico" (A. L. Burt & Co., New York, $1.25); Romero, "Coffee and India Rubber Culture in Mexico" (Put., $3.00); Romero, "Geographical and Statistical Notes on Mexico" (Put., $2.00); Schwatka, "In the Land of Cave and Cliff Dwellers" (E.P.C., $1.25); Smith, "White Umbrella in Mexico" (H.M.C., $1.50); Darton, "Mexico, the Treasure House of the World" (*N.G.M.*, Aug., '07: 493); Foster, "The New Mexico" (*N.G.M.*, Jan., '02: 1); Nelson, "A Winter Expedition in Southwestern Mexico" (*N.G.M.*, Sept., '04: 341).

Central America and Panama Canal Zone. — Belt, "Naturalist in Nicaragua" (Scrib. and Welford, New York, $3.00); Calvo, "The Republic of Costa Rica" (R.McN., $2.00); Charles, "Honduras" (R.McN., $1.50); Davis, "Three Gringos in Venezuela and Central America" (H.B., $1.50); Herbertson, "Descriptive Geography, Central and South America" (McM., $0.70); Sheldon, "Notes on the Nicaragua Canal" (McClurg, Chicago, $1.25); Stevens, "A Trip to Panama" (Lésan-Gould Co., St. Louis, gratis); Handbooks (*B. Amer. R.*) on Costa Rica, Honduras, Salvador, and Nicaragua (each $0.35, Guatemala, $0.25); Monthly Bulletins of the same Bureau (each, $0.25), also contain information about American Republics; "Across Nicaragua" (*N.G.M.*, Vol. 1, '89: 315); Articles on the Nicaragua Canal (*N.G.M.*, Aug., '99: 297); Burr, "The Republic of Panama" (*N.G.M.*, Feb., '04: 57); "Notes on Panama and Colombia" (*N.G.M.*, Dec., '03: 458); Chester, "The Panama Canal" (*N.G.M.*, Oct., '05: 445 and 467); Thompson, "Henequen — the Yucatan Fibre" (*N.G.M.*, April, '03: 150).

Physiography. — Davis, "Elementary Physical Geography" (Ginn, $1.40); Davis, "Physical Geography" (Ginn, $1.25); Dodge, "Reader in Physical Geography" (L.G., $0.70); Geikie, "Elementary Lessons in Physical Geography" (McM., $1.10); Gilbert and Brigham, "Introduction to Physical Geography" (App., $1.25); Hutchinson, "Story of the Hills" (McM., $0.50); Huxley, "Physiography, An Introduction to the Study of Nature" (App., $2.50); "National Geographic Monographs" (A.B.C., $2.50); Salisbury, "Physiography for High Schools" (Henry Holt, New York, $1.50); Shaler, "Aspects of the Earth" (Put., $2.00); Shaler, "Outlines of the Earth's History" (App., $1.75); Shaler, "The Story of our Continent" (Ginn, $1.00); Singleton, "Great Rivers of the World" (Dodd, Mead & Co., New York, $1.60); Tarr, "Elementary Geology" (McM., $1.40); Tarr, "Elementary Physical Geography" (McM., $1.40; contains references to works on Physiography); Tarr, "New Physical Geography" (McM., $1.00); Emerson, "Flood-plains in their Relation to Life" (*J.G.*, Jan., '07: 16).

Ocean, Climate, etc. — Darwin, "Tides" (H.M.C., $2.00); Guyot, "The Earth and Man" (Scrib., $1.75); Harrington, "About the Weather" (App., $0.65); Henry, "Climatology of the United States" (Government Printing Office); Ingersoll, "Book of the Ocean" (Cent., $1.50); Jackson, "Astronomical Geography" (D. C. Heath, Boston, $0.40); Pillsbury, "The Gulf Stream" (U.S. Coast Survey, Washington); Shaler, "Sea and Land" (Scrib., $2.50); Smith, "The Organization of Ocean Commerce" (Ginn, $1.25); Ward, "Climate" (Put., $2.00); "The Arid Regions of the United States" (*N.G.M.*, March, '94: 167).

Animals, Plants, etc. — Bailey, "The Nature Study Idea" (McM., $1.00); Buckham, "Afield with the Seasons" (Crowell Pub. Co., New York, $1.25); Burroughs, "Afoot and Afloat" (H.M.C., $0.25); Burroughs, "Ways of Nature" (H.M.C., $1.10); Cook, "Along Four-footed Trails" (James Pott & Co., New York, $1.50); Du Chaillu, "In African Forest and Jungle" (Scrib., $1.50); Foster, "In the Forest" (Doub., $1.50); Heilprin, "The Geographical and Geological Distribution of Animals" (App., $2.00); Hulburt, "Forest Neighbors" (McClure, Phillips & Co., New York, $1.50); Hyrst, "Adventures among Wild Beasts" (Lipp., $1.50); Ingersoll, "Wild Neighbors" (McM., $1.50); Ingersoll, "Wild Life of Orchard and Field" (H.B., $1.40); Ingersoll, "Wit of the Wild" (Dodd, Mead & Co., New York, $1.20); Johnson, "Home, Haunts, and Habits of Wild Animals" (J. C. Winston Co., Philadelphia, $1.50); Lucas, "Animals before Man in America" (App., $1.25); Mill, "Realm of Nature" (Scrib., $1.50); Roosevelt, "Hunting Trips of a Ranchman" (Put., $3.00); Scharf, "European Animals" (Dutt., $2.50); Shaler, "Domesticated Animals" (Scrib., $2.50); Shaler, "Man and the Earth" (R. K. Fox, New York, $1.50); Shaler, "Nature and Man in America" (Scrib., $1.50); Stoneman, "Plants and their Ways in South Africa" (L.G., $1.10); Walsh, "Coffee, its History, Classification, and Description"; "Tea, its History and Industry" (Coates & Co., Philadelphia, $2.00 each); Whitney, "On Snow Shoes to the Barren Grounds" (H.B., $3.50); Wright, "Four-footed Americans" (McM., $1.50); Fairchild, "Our Plant Immigrants" (*N.G.M.*, April, '06: 179); Henshaw, "The Policemen of the Air" (*N.G.M.*, Feb., '08: 79); Shires, "One Season's Game Bag with the Camera" (*N.G.M.*, June, '08: 387); Smith, "Our Fish Immigrants"; other articles on Fish and Turtles (*N.G.M.*, June, '07: 385, 400; 413); Warren, "Animal Wealth of the United States" (*N.G.M.*, Sept., '06: 511); Holdsworth, "Animal Industries" (*J.S.G.*, March, '00: 105; April, '00: 146).

South America. — There is a handbook for each of the republics, issued by the Bureau of American Republics, Washington, D.C., price from $0.30 to $0.50 each. Andrews, "Brazil, its Conditions and Prospects" (App., $1.50); Ballou, "Equatorial America" (H.M.C., $1.50); Bates, "A Naturalist on the River Amazon" (Humbolt Library, New York, $1.00); Butterworth, "South America and Panama" (Doub., $1.00); Carpenter, "Geographical Reader, South America" (A.B.C., $0.60); Carpenter, "South America, Social, Industrial, and Political" (Saalfield Pub. Co., Akron, O., $3.00); Childs, "South American Republics" (H.B., $3.50); Clairmont, "A Guide to Modern Peru" (A. de Clairmont, Toledo, O.); Conway, "The Bolivian Andes" (H.B., $3.00); Coe, "Our American Neighbors" (S.B.C., $0.60); Curtis, "Between the Andes and the Ocean" (H. S. Stone, Chicago, $2.50); Curtis, "Capitols of Spanish America" (H.B., $3.50); Curtis, "Venezuela" (H.B., $1.25); Elliott, "Chili" (Scrib., $3.00); Ford, "Tropical America" (Scrib., $2.00); Hale, "The South Americans" (Bobbs-Merrill Co., Indianapolis, $2.50); Herbertson, "Descriptive Geography, Central and South America" (McM., $0.70); Pepper, "Panama to Patagonia" (McClurg, Chicago, $2.50); Pérez Triana, "Down the Orinoco in a Canoe" (Crowell & Co., New York, $1.25); Pratt, "Pizarro: Conquest of Peru" (E.P.C., $0.30); Reynolds, "The Americas" (McM., $0.75); Rodway, "In the Guiana Wilds" (L. C. Page & Co., Boston, $1.25); Ruhl, "Other Americans" (Scrib., $2.00); Scruggs, "Columbian and Venezuelan Republics" (Little, Brown & Co., Boston, $2.50); Smith, "Temperate Chili" (McM., $3.50); Whymer, "Travels amongst the Great Andes of the Equator" (Scrib., $2.50); Adams, "Cuzco: America's Ancient Mecca" (*N.G.M.*, Oct., '08: 669); "A Journey in Ecuador" (*N.G.M.*, July, '96: 238); "A Winter Voyage through the Straits of Magellan" (*N.G.M.*, May, '97: 129); Calderon, "Peru, its Resources, Development, and Future" (*N.G.M.*, Aug., '04: 311); Curtis, "The Road to Bolivia" (*N.G.M.*, June, '00: 209; July, '00: 264); Hatcher, "Some Geographic Features of Southern Patagonia" (*N.G.M.*, Feb., '00: 41); Lee, "Beautiful Ecuador" (*N.G.M.*, Feb., '07: 81); Pepper, "South America Fifty Years Hence," and other articles on South America (*N.G.M.*, Aug., '06: 427, 432, 449, 453, 456); "Patagonia" (*N.G.M.*, Nov., '97: 305); Root, "An Awakened Continent to the South of Us" (*N.G.M.*, Jan., '07: 61); President Hubbard's Annual Address, "South America" (*N.G.M.*, March, '91: 1); "Venezuela, her Government," etc. (*N.G.M.*, Feb., '96: 49); "A Day in the Falkland Islands" (*J.S.G.*, Feb., '98: 49); "Climatic Notes made during a Voyage around South America" (*J.S.G.*, Sept. and Oct., '98: 241 and 297); "From Paros to Manaos" (*J.S.G.*, April, '01: 121); Johnson, "Trade and Industries of Western South America" (*J.G.*, Jan., '02: 25; Feb., '02: 51; March, '02: 109); "The Climatic Control of Occupation in Chile" (*J.S.G.*, Dec., '97: 289); "The Valley of the Amazon and its Development" (*J.S.G.*, Sept., '97: 193).

EUROPE. — Amicis, "Holland and its People" (Put., $2.00); Bailey, "First Impressions of Europe" (Grafton Press, New York, $1.25); Beckman, "Backsheesh; Travels in Europe, Asia Minor, etc." (Whitaker & Ray, San Francisco, $1.50); Belloc, "Hills and the Sea" (Scrib., $1.50); Bröchner, "Danish Life in Town and Country" (Put., $1.20); Carpenter, "Geographical Reader of Europe" (A.B.C., $0.75); Coe, "Modern Europe" (S.B.C., $0.60); Coolidge, "The Alps in Nature and History" (Dutt., $2.50); Corbin, "Schoolboy Life in England" (H.B., $1.25); Davis, "About Paris" (H.B., $1.25); Davis, "Our English Cousins" (H.B., $1.25); Davis, "The Rulers of the Mediterranean" (H.B., $1.25); Dillon, "Motor Days in England" (Put., $3.00); Du Chaillu, "Land of the Long Night" (Scrib., $2.00); Edwards, "Through Scandinavia to Moscow" (R. Clarke Co., Cincinnati, $1.50); Emerson, "European Glimpses and Glances" (Cassell & Co., New York, $1.00); Finck, "Spain and Morocco" (Scrib., $1.25); Geikie, "The Scenery in Scotland" (McM., $3.50); Green, "A Short Geography of the British Isles" (McM., $0.90); Green, "Army Life in Russia" (Scrib., $1.25); Hapgood, "Russian Rambles" (H.M.C., $1.50); Herbertson, "Descriptive Geographies" ("Europe," $0.90; "The British Empire," $0.75, McM.); King, "Northern Europe" (Lee & Shepard, Boston, $0.60); Knight, "Over-sea Britain" (Dutt., $2.00); Loring, "A Year in Portugal" (Put., $1.50); Lubbock, "The Scenery of Switzerland" (McM., $1.50); Lyde, "A Geography of the British Isles" (McM., $0.60); Lyde, "A Geography of Europe" (McM., $0.50); MacDonald, "Paris of the Parisians" (Lipp., $1.50); Mackinder, "Britain and the British Isles" (App., $2.00); Maxwell, "A Cruise across Europe" (J. Lane Co., New York, $3.00); Moncrieff, "The Peak Country" (McM., $2.50); Monroe, "Norway, its People, its Fjords, and its Fjelds" (L. C. Page, Boston, $3.00); Nixon-Roulet, "Our Little Grecian Cousin" (L. C. Page, Boston, $0.60); Partsch, "Central Europe" (App., $2.00); Paton, "Picturesque Sicily" (H.B., $2.50); Pratt, "Legends of Norseland" (E.P.C., $0.40); Pratt, "Stories of England" (E.P.C., $0.40); Pratt, "Stories from Old Germany" (E.P.C., $0.40); Rushing, "European Days and Ways" (Jennings & Graham, Cincinnati, $1.50); Sime, "Geography of Europe" (McM., $0.80); Stephens, "Portugal" (Put., $1.50); Stepniak, "The Russian Peasantry" (H.B., $1.25); Stepniak, "Russia under the Tzars" (Scrib., $1.50); Stevenson, "An Inland Voyage" (Scrib., $1.25); Stevenson, "Travels with a Donkey in the Cevennes" (McM., $0.25); Stoddard, "Spanish Cities" (Scrib., $1.50); Sullivan, "Lands of Summer" (H.M.C., $1.50); Thomas, "Sweden and the Swedes" (R.McN., $3.75); Tozer, "Islands of the Ægean" (Oxford Pub. Co., New York, $2.25); Tyndall, "Hours of Exercise in the Alps" (App., $2.00); Van Norman, "Poland, the Knight among Nations" (F. H. Revell Co., New York, $1.50); Wendell, "The France of To-day" (Scrib., $1.50); Series: French, German, Russian, Dutch, and Swiss, "Life in Town and Country" (Put., $1.20 each); Bosson, "Sicily, the Battlefield of Nations and of Nature" (*N.G.M.*, Jan., '09: 97); Bracq, "Colonial Expansion of France" (*N.G.M.*, June, '00: 225); "Bulgaria, the Peasant State" (*N.G.M.*, Nov., '08: 760); Coffin, "Where East meets West" (*N.G.M.*, May, '08: 309); Curtis, "The Great Turk and his Lost Provinces" (*N.G.M.*, Feb., '03: 45); Gore, "As seen from a Dutch Window" (*N.G.M.*, Sept., '08: 619); Grosvenor, "The Growth of Russia" (*N.G.M.*, May, '00: 169); Koch, "In Quaint, Curious Croatia" (*N.G.M.*, Dec., '08: 809); Koch, "Gibraltar" (*J.G.*, Nov., '05: 378); Koch, "The Forbidden Balkans" (*J.G.*, Oct., '06: 354; Nov., '06: 406; Dec., '06: 451); Matthes, "The Dikes of Holland" (*N.G.M.*, June, '01: 219); Mead, "The Expansion of England" (*N.G.M.*, July, '00: 249); Noyes, "A Visit to Lonely Iceland" (*N.G.M.*, Nov., '07: 731); "Servia and Montenegro" (*N.G.M.*, Nov., '08: 774); Wright, "The World's Most Cruel Earthquake" (*N.G.M.*, April, '09: 373); "Austria" (*J.S.G.*, Dec., '98: 394); Barrett, "Features of Norway and its People" (*J.S.G.* Sept., '01: 241; Oct., '01: 294); Jefferson, "Cæsar and the Central Plateau of France" (*J.G.*, Nov., '07: 113); Jefferson, "Man in West Norway" (*J.G.*, Dec., '08: 86); Reynolds, "Mistress Europe Teaching her School" (*J.S.G.*, Sept., '00: 241); "The Geography of Greater London" (*J.S.G.*, Feb., '01: 41); "Notes on the Geography of Scotland" (*J.S.G.*, May, '98: 161); "The Temperature of the British Isles" (*J.S.G.*, Dec., '98: 361).

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AFRICA. — Badlam, "Views in Africa" (S.B.C., $0.72); Bigelow, "White Man's Africa" (H.B., $2.50); Bryce, "Impressions of South Africa" (Cent., $3.50); Carpenter, "Geographical Reader of Africa" (A.B.C., $0.60); Crosby, "Abyssinia, the Country and People" (*N.G.M.*, March, '01: 89); Curtis, "Nile Notes of a Howadji" (H.B., $1.50); Davis, "The Congo and Coasts of Africa" (Scrib., $1.50); Drummond, "Tropical Africa" (Scrib., $1.00); Du Chaillu, "My Apingi Kingdom"; "Wild Life Under the Equator" (H.B., $1.25 each); Edwards, "A Thousand Miles up the Nile" (Dutt., $2.50); Herbertson, "Descriptive Geography, Africa" (McM., $0.70); Hillegas, "Oom Paul's People" (App., $1.50); Kirkland, "Some African Highways" (Dana, Estes & Co., Boston, $1.50); Lyde, "A Geography of Africa" (McM., $0.50); Penfield, "Present Day Egypt" (Cent., $2.00); Rawlinson, "The Story of Ancient Egypt" (Put., $1.50); Selous, "African Nature Note and Reminiscences" (McM., $3.00); Selous, "A Hunter's Wanderings in Africa" (McM., $2.50); Stanley and others, "Africa: its Partition and its Future" (Dodd, Mead & Co., New York, $1.25); Stanley, "My Dark Companions" (Scrib., $2.00); Stanley, "My Kalulu" (Scrib., $1.50); Stanley, "Through South Africa" (Scrib., $1.00); Traill, "From Cairo to the London Frontier" (John Lane, New York, $1.50); Verner, "Pioneering in Central Africa" (Presbytarian Board of Publication, Philadelphia, $2.00); White, "A Little Story of South Africa and up the East Coast" (A. Flanagan, Chicago, $0.50); Younghusband, "South Africa of To-day" (McM., $2.00); "Abyssinia" (*N.G.M.*, March, '01: 89); "Africa since 1888" (*N.G.M.*, May, '96: 157); Annual Address of President Hubbard, "Africa, its Past and Future" (*N.G.M.*, Vol. 1, '89: 99); Bosson, "Biskra, the Ziban Queen" (*N.G.M.*, Aug., '08: 563); Bridgeman, "The New British Empire of Sudan" (*N.G.M.*, May, '06: 242); Hilder, "British South Africa and the Transvaal" (*N.G.M.*, March, '00: 81); Landor, "Across the Wildest Africa" (*N.G.M.*, Oct., '08: 694); Perdicaris, "Morocco, the Land of the Extreme West" (*N.G.M.*, March, '06: 117); "The Gold Coast, Ashanti and Kumassi" (*N.G.M.*, Jan., '97: 1); Williams, "The Diamond Mines of South Africa" (*N.G.M.*, June, '06: 344); Wollaston, "Amid the Snow Peaks of the Equator" (*N.G.M.*, March, '09: 256); Platt, "Climatic Control in the Desert" (*J.S.G.*, Sept., '00: 255); "The Egyptian Sudan and its History" (*J.S.G.*, Feb., '99: 41).

AUSTRALIA AND THE ISLANDS OF THE PACIFIC. — Ballou, "Under the Southern Cross" (H.M.C., $1.50); Carpenter, "Geographical Reader, Australia and Islands of the Sea" (A.B.C., $0.60); Chalmers, "Pioneer Life and Work in New Guinea" (F. H. Revell & Co., New York, $1.50); Davitt, "Life and Progress in Australasia" (New Amsterdam Book Co., New York, $2.50); Herbertson, "Descriptive Geography: Australia and Oceanica" (McM., $0.80); José, "Australia, and New Zealand" (McM., $0.40); Kellogg, "Australia and the Islands of the Sea" (S.B.C., $.068); Loughman, "New Zealand at Home" (Scrib., $1.75); Nixon-Roulet, "Our Little Australian Cousin" (L. C. Page & Co., Boston, $0.60);

Pratt, "Stories of Australasia" (E.P.C., $0.40); Reeves, "Brown Men and Women" (McM., $3.50); Shoemaker, "Islands of the Southern Seas" (Put., $2.25); Grimshaw, "In the Savage South Seas" (Lipp., Phila.); Lloyd, "New Zealand" (*N.G.M.*, Sept., '02: 342); Morgan, "The Samoan Islands" (*N.G.M.*, Nov., '00: 417); Safford, "Guam, our Smallest Possession" (*N.G.M.*, May, '05: 229); "Samoa" (*N.G.M.*, June, '00: 207); "The Samoan Islands" (*N.G.M.*, Nov., '00: 417); Kellogg, "American Samoa" (*J.G.*, Jan., '06: 18).

APPENDIX I

TABLES OF AREA, POPULATION, ETC.

NOTE. — The figures, 1910, etc., refer to the year in which the Census was taken or the estimate was made. Most of the recent figures are obtained from the United States Census Reports of 1910 or from "The Statesman's Year Book," 1912.

SIZE OF EARTH

Length of Earth's Diameter at the Equator (miles)	7.926
Length of Equator (miles)	24,902
The Earth's Surface (square miles)	196,940,000
Total Area of Ocean (square miles)	141,486,000

CONTINENTS AND PRINCIPAL COUNTRIES, COLONIES, ETC.

	Area in Square Miles	Population
North America	**8,500,000**	**125,000,000**
Alaska, 1910	590,884	64,356
Antigua, 1911	170	38,899
Bahama Islands, 1911	5,450	55,944
Bermuda Islands, 1911	20	18,994
British Honduras, 1911	8,598	40,458
Canada, 1911	3,603,910	7,192,338
Costa Rica, 1910	18,400	379,533
Cuba, 1910	44,000	2,150,112
Greenland, 1901	46,740	11,893
Guatemala, 1910	48,290	1,992,000
Haiti (Island), 1909	10,204	2,029,700
Honduras, 1910	46,250	553,446
Jamaica, 1910	4,200	862,422
Mexico, 1910	767,005	15,063,207
Newfoundland, 1910	42,734	237,531
Labrador, 1910	120,000	4,076
Nicaragua, 1910	49,200	600,000
Panama, 1909	31,500	419,029
St. Croix, 1901	84	18,401
St. Thomas, 1901	32	11,269
Salvador, 1910	7,225	1 070,555
United States, see p. 425		
South America	**7,400,000**	**49,000,000**
Argentina, 1910	1,135,840	7,091,822
Bolivia, 1910	708,195	2,267,935
Brazil, 1908	3,218,991	21,461,100
Chile, 1910	292,580	3,329,030
Colombia, 1908	438,436	4,303,000
Ecuador, 1910 Galapagos Islands, 1910	116,000	1,500,000
Falkland Islands, 1911	5,500	2,272
Guiana, British, 1911	90,277	296,000
Guiana, Dutch, 1910	46,060	85,094
Guiana, French, 1911	30,500	49,009
Paraguay, 1910	171,204	752,000
Peru, 1910	695,733	4,000,000
South Georgia Islands	1,000	uninhabited
Tobago, 1911	114	330,074
Trinidad Island, 1911	1,754	
Uruguay, 1910	72,210	1,112,000
Venezuela, 1911	393,976	2,713,703
Europe	**3,796,000**	**392,246,000**
Albania, 1913	10,900	900,000
Andorra,	175	5,231
Austria, 1910	115,903	28,567,898
Austria-Hungary, 1910	261,100	51,323,921
Balearic Isles, 1910	1,935	325,703
Belgium, 1910	11,373	7,516,730
British Empire, 1910	11,454,862	397,261,509
British Isles, 1910	121,390	45,469,564
Bulgaria, 1913	43,360	4,800,000
Corsica, 1906	3,367	291,160
Crete, 1900	3,365	310,185
Denmark, 1906	15,592	2,605,268
England, 1901	50,874	31,071,703
England and Wales, 1909	58,324	35,756,615
Faroe Islands, 1901	540	16,349
France, 1906	207,054	39,252,245
German Empire, 1905	208,780	60,641.278
Great Britain, 1909	88,729	40,634,263
Greece, 1913	46,600	4,600,000
Hebrides Islands	3,000	100,000
Hungary, 1900	125,430	19,254,559
Iceland, 1901	39,756	78,470
Ireland, 1909	32,360	4,374,158
Italy, 1909	110,659	34,269,746
Liechtenstein, 1906	65	9,650
Luxemburg, 1900	1,706	219,210
Malta, 1909	95	212,888
Monaco, 1909	8	19,121
Montenegro, 1913	5,600	500,000
Netherlands, 1908	12,648	5,825,198
Norway, 1908	124,130	2,352,786
Orkney Islands, 1901	376	28,699
Portugal, 1900	35,490	5,423,132
Prussia, 1905	134,616	37,293,324
Roumania, 1913	54,300	7,400,000
Russia, 1908	1,862,524	113,841,000
Russian Empire, 1908	8,647,657	155,433,300
San Marino, 1909	38	10,310
Sardinia, 1909	9,306	861,249
Scotland, 1909	30,405	4,877,648
Servia, 1913	33,600	4,300,000
Shetland Islands, 1901	551	28,166
Sicily, 1909	9,935	3,574,424
Spain, 1908	194,783	19,712,585
Sweden, 1908	172,876	5,429,600
Switzerland, 1908	15,976	3,559,349
Turkey, 1913	9.700	1,600,000
Turkish Empire, 1913	1,509,350	30,869,800
Wales, 1911	7,450	2,032,193
Asia with East Indies	**21,000,000**	**900,000,000**
Aden, 1911	75	46,165
Afghanistan, 1911	250,000	5,900,000
Arabia	1,200,000	4,825,000
Baluchistan, 1911	134,638	829,712
Bhutan, 1909	20,000	250,000

	Area in Square Miles	Population
Bokhara, 1909	83,000	1,250,000
Burma, 1911	236,738	12,115,217
Ceylon, 1911	25,332	3,592,397
China (proper), 1906	1,532,420	407,253,030
Republic of China, 1910	4,277,170	438,425,000
Chinese Turkestan, 1906	550,340	1,200,000
Cyprus, 1910	3,584	261,587
Formosa, 1910	13,458	3,123,471
French India, 1909	196	277,000
French Indo-China, 1906	256,000	16,315,063
India, 1911	1,789,154	315,132,537
Japan, 1910	147,655	50,751,919
Khiva, 1909	24,000	800,000
Korea, 1911	86,000	13,125,027
Manchuria, 1909	363,610	16,000,000
Mongolia, 1906	1,367,600	2,600,000
Nepal, 1909	54,000	5,000,000
Oman, 1909	82,000	500,000
Palestine, 1905	10,000	700,000
Persia, 1909	628,000	9,500,000
Portuguese Indies, 1901	7,330	300,000
Russia in Asia, 1910	6,207,662	24,889,000
Siam, 1909	195,000	6,686,486
Siberia, 1910	4,786,730	8,220,100
Straits Settlements, 1911	1,472	714,069
Sungaria, 1901	147,950	600,000
Tibet, 1909	463,200	6,500,000
Turkey in Asia, 1909	693,610	17,683,500
Africa	**11,000,000**	**125,000,000**
Abyssinia, 1910	432,432	5,000,000
Algeria (Fr.), 1911	343,500	5,563,828
Anglo-Egyptian Sudan, 1909	950,000	2,363,000
Angola, 1909	484,800	4,119,000
Belgian Congo, 1909	909,650	20,000,000
British Somaliland, 1910	68,000	348,000
Canary Islands (Sp.), 1910	2,807	419,809
Cape of Good Hope, 1910	276,995	2,510,000
Cape Verde Islands (Port.), 1909	1,480	147,424
Egypt, 1907	400,000	11,139,978
Eritrea (Italy), 1906	45,800	450,000
French Congo, 1907	669,280	5,000,000
French Somaliland, 1907	5,790	180,000
Gambia (Br.), 1910	3,619	160,000
German East Africa, 1909	384,180	10,000,000
German Southwest Africa, 1909	322,450	120,000
Gold Coast and Protectorate, 1910	119,200	1,500,000
Italian Somaliland, 1909	139,430	400,000
Kamerun (Ger.), 1909	191,130	3,000,000
Liberia, 1909	40,000	1,500,000– 2,100,000
Madagascar, 1911	228,000	3,054,658
Madeira Islands, 1900	314	150,574
Mauritius (Br.), 1910	835	379,184
Morocco, 1909	219,000	4,340,000– 4,580,000
Natal, 1911	35,371	1,191,958
Nigeria, Northern, 1911	256,400	9,269,000
Nigeria, Southern, 1911	77,260	7,858,689
Orange Free State, 1910	50,392	478,815
Portuguese East Africa, 1901	298,400	3,120,000
Portuguese Guinea, 1901	13,940	820,000
Réunion Island (Fr.), 1907	910	201,000
St. Helena (Br.), 1911	47	3,520
Sierra Leone and Protectorate (Br.), 1910	30,000	1,100,000
Spanish Africa, 1910	85,814	235,844
Togo, 1910	33,700	1,000,000
Transvaal, 1910	110,426	1,400,000
Tripoli (Turk.), 1906	398,900	1,000,000
Tunis (Fr.), 1910	45,779	1,923,217
Uganda Protectorate, 1910	223,500	3,500,000
Zanzibar (Br.), 1910	1,020	200,000
Australia, Commonwealth of	**3,000,000**	**4,400,000**
New South Wales, 1910	310,372	1,621,677
Northern Territory, 1910	523,620	3,239
Queensland, 1910	670,500	572,654
South Australia, 1910	380,070	412,808
Tasmania, 1910	26,215	186,860
Victoria, 1911	87,884	1,315,000
Western Australia, 1911	975,920	283,986
East Indies and larger islands of the Pacific	**1,200,000**	**47,000,000**
Borneo, 1905	298,843	1,944,655
Celebes, 1905	71,470	851,905
Fiji Islands, 1910	7,740	133,831
Hawaiian Islands, 1910	6,449	191,909
Java and Madura, 1905	50,554	30,098,008
Molucca Islands, 1905	43,864	407,906
New Caledonia, 1911	7,650	55,000
New Guinea		
British Guinea, 1910	151,789	200,000
Dutch Guinea, 1905	90,540	351,603
German Guinea, 1910	95,160	356,000
New Zealand, 1910	104,751	1,048,347
Philippine Islands, 1910	115,026	8,276,802
Samoa Islands, 1910	1,079	41,140
Solomon Islands (Br.), 1910	12,000	150,310
Solomon Islands (Ger.)	4,200	
Sumatra, 1905	161,612	4,029,503
Total Area of Continents		**56,000,000**
Total Population		**1,700,000,000**

STATES AND TERRITORIES OF THE UNITED STATES

	Area in Square Miles	Population 1900	Population 1910
Alabama	51,998	1,828,697	2,138,093
Alaska	590,884	63,592	64,356
Arizona	113,956	122,931	204,354
Arkansas	53,335	1,311,564	1,574,449
California	158,297	1,485,053	2,377,549
Colorado	103,948	539,700	799,024
Connecticut	4,965	908,420	1,114,756
Delaware	2,370	184,735	202,322
District of Columbia	70	278,718	331,069
Florida	58,666	528,542	752,619
Georgia	59,265	2,216,331	2,609,121
Guam	210	8,561	11,973
Hawaiian Islands	6,449	154,001	191,909
Idaho	84,318	161,772	325,594
Illinois	56,665	4,821,550	5,638,591
Indiana	36,354	2,516,462	2,700,876
Iowa	56,147	2,231,853	2,224,771
Kansas	82,158	1,470,495	1,690,949
Kentucky	40,598	2,147,174	2,289,905
Louisiana	48,506	1,381,625	1,656,388
Maine	33,040	694,466	742,371
Maryland	12,327	1,188,044	1,295,346
Massachusetts	8,266	2,805,346	3,366,416
Michigan	57,980	2,420,982	2,810,173
Minnesota	84,682	1,751,394	2,075,708
Mississippi	46,865	1,551,270	1,797,114
Missouri	69,420	3,106,665	3,293,335
Montana	146,572	243,329	376,053
Nebraska	77,520	1,066,300	1,192,214
Nevada	110,690	42,335	81,875
New Hampshire	9,341	411,588	430,572
New Jersey	8,224	1,883,669	2,537,167
New Mexico	122,634	195,310	327,301
New York	49,204	7,268,894	9,113,614
North Carolina	52,426	1,893,810	2,206,287
North Dakota	70,837	319,146	557,056
Ohio	41,040	4,157,545	4,767,121
Oklahoma	70,057	790,391	1,657,155
Oregon	96,699	413,536	672,765
Pennsylvania	45,126	6,302,115	7,665,111

	Area in Square Miles	Population 1900	Population 1910
Philippine Islands	127,853	7,360,551	8,276,802
Porto Rico	3,606	962,019	1,118,012
Rhode Island	1,248	428,556	542,610
South Carolina	30,989	1,340,316	1,515,400
South Dakota	77,615	401,570	583,888
Tennessee	42,022	2,020,616	2,184,789
Texas	265,896	3,048,710	3,896,542
Tutuila	77	3,800	6,780
Utah	84,990	276,749	373,351
Vermont	9,564	343,641	355,956
Virginia	42,627	1,854,184	2,061,612
Washington	69,127	518,103	1,141,990
West Virginia	24,170	958,800	1,221,119
Wisconsin	56,066	2,069,042	2,333,860
Wyoming	97,914	92,531	145,965
United States, total	**3,624,122**	**77,256,630**	**93,402,151**
United States (without Alaska, Philippine Islands, etc.)	**3,026,789**	**75,994,575**	**91,972,266**

TWENTY-FIVE OF THE LARGEST CITIES IN THE WORLD

		Population
1.	London, England, 1910	4,872,702
	Greater London, 1910	7,537,196
2.	New York, U.S., 1910	4,766,883
3.	Paris, France, 1911	2,846,986
4.	Tokyo, Japan, 1909	2,168,069
5.	Chicago, U.S., 1910	2,185,283
6.	Berlin, Germany, 1910	2,070,695
7.	Vienna, Austria-Hungary, 1911	2,004,291
8.	Petrograd, Russia, 1910	1,907,708
9.	Canton, China	1,600,000
10.	Philadelphia, U.S., 1910	1,549,008
11.	Moscow, Russia, 1907	1,359,254
12.	Buenos Aires, Argentina, 1911	1,326,994
13.	Calcutta, India, 1910	1,216,514
14.	Constantinople, Turkey	1,125,000
15.	Osaka, Japan, 1908	1,117,151
16.	Shanghai, China	1,000,000
17.	Tientsin, China, 1910	1,000,000
18.	Rio de Janeiro, Brazil, 1909	1,000,000
19.	Bombay, India, 1910	972,892
20.	Hamburg, Germany, 1910	936,000
21.	Liverpool, England, 1910	767,606
22.	Glasgow, Scotland, 1909	872,021
23.	Warsaw, Russia, 1901	756,426
24.	Budapest, Austria-Hungary, 1901	732,322
25.	Barcelona, Spain, 1911	700,000

TWENTY-FIVE LARGEST CITIES IN THE UNITED STATES

		Population 1900	Population 1910
1.	New York, N.Y.	3,437,202	4,766,883
2.	Chicago, Ill.	1,698,575	2,185,283
3.	Philadelphia, Pa.	1,293,697	1,549,008
4.	St. Louis, Mo.	575,238	687,029
5.	Boston, Mass.	560,892	670,585
6.	Cleveland, Ohio	381,768	560,663
7.	Baltimore, Md.	508,957	558,485
8.	Pittsburgh, Pa.	321,616	533,905
9.	Detroit, Mich.	285,704	465,766
10.	Buffalo, N.Y.	352,387	423,715
11.	San Francisco, Cal.	342,782	416,912
12.	Milwaukee, Wis.	285,315	373,857
13.	Cincinnati, Ohio.	325,902	364,463
14.	Newark, N.J.	246,070	347,469
15.	New Orleans, La.	287,104	339,075
16.	Washington, D.C.	278,718	331,069
17.	Los Angeles, Cal.	102,479	319,198
18.	Minneapolis, Minn.	202,718	301,408
19.	Jersey City, N.J.	206,433	267,779
20.	Kansas City, Mo.	163,752	248,381
21.	Seattle, Wash.	80,671	237,194
22.	Indianapolis, Ind.	169,164	233,650
23.	Providence, R.I.	175,597	224,326
24.	Louisville, Ky.	204,731	223,928
25.	Rochester, N.Y.	162,608	218,146

GROWTH OF THE FIFTEEN LARGEST CITIES OF THE COUNTRY

	City	1800	1830	1890	1900	1910
1.	New York, N.Y.	60,489 (1)	197,112 (1)	2,507,414 (1)	3,437,202 (1)	4,766,883
2.	Chicago, Ill.	——	4,470 (1840)	1,099,850 (2)	1,698,575 (2)	2,185,283
3.	Philadelphia, Pa.	41,220 (2)	80,462 (3)	1,046,964 (3)	1,293,697 (3)	1,549,008
4.	St. Louis, Mo.	10,049 (1820)	14,125 (7)	451,770 (4)	575,238 (4)	687,029
5.	Boston, Mass.	24,937 (4)	61,392 (4)	448,477 (5)	560,892 (5)	670,585
6.	Cleveland, Ohio.	606 (1820)	1,076 (12)	261,353 (9)	381,768 (7)	560,663
7.	Baltimore, Md.	26,514 (3)	80,620 (2)	434,439 (6)	508,957 (6)	558,485
8.	Pittsburgh, Pa.	1,565 (5)	12,568 (8)	238,617 (12)	321,616 (11)	533,905
9.	Detroit, Mich.	1,422 (1820)	2,222 (11)	205,876 (13)	285,704 (13)	465,766
10.	Buffalo, N.Y.	2,095 (1820)	8,668 (10)	255,664 (10)	352,387 (8)	423,715
11.	San Francisco, Cal.	——	——	298,997 (7)	342,782 (9)	416,912
12.	Milwaukee, Wis.	——	1,172 (1840)	204,468 (14)	285,315 (14)	373,857
13.	Cincinnati, Ohio.	2,540 (1810)	24,831 (6)	296,908 (8)	325,902 (10)	364,463
14.	Newark, N.J.	8,008 (1810)	10,953 (9)	181,830 (15)	246,070 (15)	347,469
15.	New Orleans, La.	17,242 (1810)	29,737 (5)	242,039 (11)	287,104 (12)	339,075

CITIES OF THE UNITED STATES WITH 25,000 OR MORE INHABITANTS IN 1910; AND A FEW OTHERS, MOSTLY MENTIONED IN THE BOOK

	Population, 1900	Population, 1910
Akron, Ohio	42,728	69,067
Albany, N.Y.	94,151	100,253
Albuquerque, N.M.	6,238	11,020
Allentown, Pa.	35,416	51,913
Altoona, Pa.	38,973	52,127
Amsterdam, N.Y.	20,929	31,267
Anaconda, Mont.	9,453	10,134
Annapolis, Md.	8,575	8,609
Ann Arbor, Mich.	14,509	14,817
Asheville, N.C.	14,694	18,762
Ashland, Wis.	13,074	11,594
Astoria, Ore.	8,381	9,599
Atchison, Kan.	15,722	16,429
Atlanta, Ga.	89,872	154,839
Atlantic City, N.J.	27,838	46,150
Auburn, Me.	12,951	15,064
Auburn, N.Y.	30,345	34,668
Augusta, Ga.	39,441	41,040
Augusta, Me.	11,683	13,211
Aurora, Ill.	24,147	29,807

	Population, 1900	Population, 1910
Austin, Tex.	22,258	29,860
Baltimore, Md.	508,957	558,485
Bangor, Me.	21,850	24,803
Barre, Vt.	8,448	10,734
Bath, Me.	10,477	9,396
Baton Rouge, La.	11,269	14,897
Battle Creek, Mich.	18,563	25,267
Bay City, Mich.	40,747	45,166
Bayonne, N.J.	32,722	55,545
Bellingham, Wash.	11,062	24,296
Berkeley, Cal.	13,214	40,434
Biddeford, Me.	16,145	17,079
Billings, Mont.	3,221	10,031
Binghamton, N.Y.	39,647	48,443
Birmingham, Ala.	38,415	132,685
Bisbee, Ariz.	7,000	9,019
Bismarck, N.D.	3,319	5,443
Bloomington, Ill.	23,286	25,768
Boise, Idaho	5,957	17,358
Boston, Mass.	560,892	670,585
Bradford, Pa.	15,029	14,544
Bridgeport, Conn.	70,996	102,054
Brockton, Mass.	40,063	56,878
Brookline, Mass.	19,935	27,792
Brunswick, Ga.	9,081	10,182
Buffalo, N.Y.	352,387	423,715
Burlington, Vt.	18,640	20,463
Butte, Mont.	30,470	39,165
Cambridge, Mass.	91,886	104,839
Camden, N.J.	75,935	94,538
Canton, Ohio	30,667	50,217
Carson City, Nev.	2,100	2,466
Cedar Rapids, Iowa	25,656	32,811
Champaign, Ill.	9,098	12,421
Charleston, S.C.	55,807	58,833
Charleston, W. Va.	11,099	22,996
Charlotte, N.C.	18,091	34,014
Chattanooga, Tenn.	30,154	44,604
Chelsea, Mass.	34,072	32,452
Chester, Pa.	33,988	38,537
Cheyenne, Wyo.	14,087	11,320
Chicago, Ill.	1,698,575	2,185,283
Chicopee, Mass.	19,167	25,401
Cincinnati, Ohio	325,902	364,463
Clarksville, Tenn.	9,431	8,548
Cleveland, Ohio	381,768	560,663
Clinton, Iowa	22,698	25,577
Colorado Springs, Colo.	21,085	29,078
Columbia, S.C.	21,108	26,319
Columbus, Ga.	17,614	20,554
Columbus, Ohio	125,560	181,548
Concord, N.H.	19,632	21,497
Council Bluffs, Iowa	25,802	29,292
Covington, Ky.	42,938	53,270
Cripple Creek, Colo.	10,147	6,206
Dallas, Tex.	42,638	92,104
Danville, Ill.	16,354	27,871
Danville, Va.	16,520	19,020
Davenport, Iowa	35,254	43,028
Dayton, Ohio	85,333	116,577
Decatur, Ill.	20,754	31,140
Denver, Colo.	133,859	213,381
Des Moines, Iowa	62,139	86,368
Detroit, Mich.	285,704	465,766
Douglas, Ariz.	——	6,437
Dover, Del.	3,329	3,720
Dover, N.H.	13,207	13,247
Dubuque, Iowa	36,297	38,494
Duluth, Minn.	52,969	78,466
Durham, N.C.	6,679	18,241
Easton, Pa.	25,238	28,523
East Orange, N.J.	21,506	34,371
Eastport, Me.	5,311	4,961
East St. Louis, Ill.	29,655	58,547
Elgin, Ill.	22,433	25,976
Elizabeth, N.J.	52,130	73,409
Elmira, N.Y.	35,672	37,176
El Paso, Tex.	15,906	39,279
Erie, Pa.	52,733	66,525
Evanston, Ill.	19,259	24,978
Evansville, Ind.	59,007	69,647
Everett, Mass.	24,336	33,484
Fall River, Mass.	104,863	119,295
Fargo, N.D.	9,589	14,331
Findlay, Ohio	17,613	14,858
Fitchburg, Mass.	31,531	37,826
Flint, Mich.	13,103	38,550
Fort Wayne, Ind.	45,115	63,933
Fort Worth, Tex.	26,688	73,312
Frankfort, Ky.	9,487	10,465
Fresno, Cal.	12,470	24,892
Galveston, Tex.	37,789	36,981
Gloucester, Mass.	26,121	24,398
Goldfield, Nev.	——	4,838
Grand Rapids, Mich.	87,565	112,571
Greeley, Colo.	3,023	8,179
Green Bay, Wis.	18,684	25,236
Greenville, S.C.	11,860	15,741
Guthrie, Ok.	10,006	11,654
Hamilton, Ohio	23,914	35,279
Harrisburg, Pa.	50,167	64,186
Hartford, Conn.	79,850	98,915
Haverhill, Mass.	37,175	44,115
Hazelton, Pa.	14,230	25,452
Helena, Mont.	10,770	12,515
High Point, N.C.	4,163	9,525
Hilo, Hawaiian Islands	19,785	6,745
Hoboken, N.J.	59,364	70,324
Holyoke, Mass.	45,712	57,730
Honolulu, Hawaiian Islands	39,306	52,183
Hot Springs, Ark.	9,973	14,434
Houghton, Mich.	3,595	5,113
Houston, Tex.	44,633	78,800
Huntington, W. Va.	11,923	31,161
Huntsville, Ala.	8,068	7,611
Indianapolis, Ind.	169,164	233,650
Ishpeming, Mich.	13,255	12,448
Ithaca, N.Y.	13,136	14,802
Jackson, Mich.	25,180	31,433
Jackson, Miss.	7,816	21,262
Jacksonville, Fla.	28,429	57,699
Jamestown, N.Y.	22,892	31,297
Jefferson City, Mo.	9,664	11,850
Jersey City, N.J.	206,433	267,779
Johnstown, Pa.	35,936	55,482
Joliet, Ill.	29,353	34,670
Joplin, Mo.	26,023	32,073
Juneau, Alaska	1,864	1,644
Kalamazoo, Mich.	24,404	39,437
Kansas City, Kan.	51,418	82,331
Kansas City, Mo.	163,752	248,381
Key West, Fla.	17,114	19,945
Kingston, N.Y.	24,535	25,908
Knoxville, Tenn.	32,637	36,346
La Crosse, Wis.	28,895	30,417
Lancaster, Pa.	41,459	47,227
Lansing, Mich.	16,485	31,229
Laramie, Wyo.	8,207	8,237
Lawrence, Mass.	62,559	85,892
Leadville, Colo.	12,455	7,508
Lewiston, Idaho	2,425	6,043
Lewiston, Me.	23,761	26,247
Lexington, Ky.	26,369	35,099
Lima, Ohio	21,723	30,508
Lincoln, Neb.	40,169	43,973
Little Rock, Ark.	38,307	45,941
Lockport, N.Y.	16,581	17,970
Lorain, Ohio	16,028	28,833
Los Angeles, Cal.	127,927	319,198
Louisville, Ky.	204,731	223,928
Lowell, Mass.	94,969	106,294
Lynchburg, Va.	18,891	29,494
Lynn, Mass.	68,513	89,336
Macon, Ga.	23,272	40,665
Madison, Wis.	19,164	25,531
Malden, Mass.	33,664	44,404
Manchester, N.H.	56,987	70,063
Manila, Philippines, 1903	219,928	——
Marquette, Mich.	10,058	11,503
McKeesport, Pa.	34,227	42,694

	Population, 1900	Population, 1910
Memphis, Tenn.	102,320	131,105
Meriden, Conn.	24,296	27,265
Miami, Fla.	1,681	5,471
Milwaukee, Wis.	285,315	373,857
Minneapolis, Minn.	202,718	301,408
Mobile, Ala.	38,469	51,521
Montgomery, Ala.	30,346	38,136
Montpelier, Vt.	6,266	7,856
Mount Vernon, N.Y.	21,228	30,919
Muskogee, Okla.	4,254	25,278
Nashua, N.H.	23,898	26,005
Nashville, Tenn.	80,865	110,364
Natchez, Miss.	12,210	11,791
Newark, N.J.	246,070	347,469
Newark, Ohio	18,157	25,404
New Bedford, Mass.	62,442	96,652
New Britain, Conn.	25,998	43,916
Newburgh, N.Y.	24,943	27,805
Newcastle, Pa.	28,339	36,280
New Haven, Conn.	108,027	133,605
New Orleans, La.	287,104	339,075
Newport, Ky.	28,301	30,309
Newport, R.I.	22,441	27,149
Newport News, Va.	19,635	20,205
New Rochelle, N.Y.	14,720	28,867
Newton, Mass.	33,587	39,806
New York, N.Y.	3,437,202	4,766,883
Niagara Falls, N.Y.	19,457	30,445
Nome City, Alaska	12,486	2,600
Norfolk, Va.	46,624	67,452
Norristown, Pa.	22,265	27,875
North Yakima, Wash.	3,154	14,082
Oakland, Cal.	66,960	150,174
Ogden, Utah	16,313	25,580
Oil City, Pa.	13,264	15,657
Oklahoma City, Okla.	10,037	64,205
Olean, N.Y.	9,462	14,743
Olympia, Wash	4,082	6,996
Omaha, Neb.	102,555	124,096
Orange, N.J.	24,141	29,630
Oshkosh, Wis.	28,284	33,062
Oswego, N.Y.	22,199	23,368
Pasadena, Cal.	9,117	30,291
Passaic, N.J.	27,777	54,773
Paterson, N.J.	105,171	125,600
Pawtucket, R.I.	39,231	51,622
Pensacola, Fla.	17,747	22,982
Peoria, Ill.	56,100	66,950
Perth Amboy, N.J.	17,690	32,121
Petersburg, Va.	21,810	24,147
Philadelphia, Pa.	1,293,697	1,549,008
Phœnix, Ariz.	5,544	11,134
Pierre, S.D.	2,306	3,656
Pittsburgh, Pa.	321,616	533,905
Pittsfield, Mass.	21,766	32,121
Plymouth, Mass.	9,562	12,141
Pomona, Cal.	5,526	10,207
Ponce, Porto Rico, 1899	27,952	35,027
Portland, Me.	50,145	58,571
Portland, Ore.	90,426	207,214
Portsmouth, N.H.	10,637	11,269
Portsmouth, Va.	17,427	33,190
Poughkeepsie, N.Y.	24,029	27,936
Prescott, Ariz.	3,559	5,092
Providence, R.I.	175,597	224,326
Provincetown, Mass., 1895	4,555	4,369
Pueblo, Colo.	28,157	44,395
Quincy, Ill.	36,252	36,587
Quincy, Mass.	23,899	32,642
Racine, Wis.	29,102	38,002
Raleigh, N.C.	13,643	19,218
Reading, Pa.	78,961	96,071
Redlands, Cal.	4,797	10,449
Richmond, Va.	85,050	127,628
Riverside, Cal.	7,973	15,212
Roanoke, Va.	21,495	34,874
Rochester, N.Y.	162,608	218,149
Rockford, Ill.	31,051	45,401
Rome, Ga.	7,291	12,099
Rutland, Vt.	11,499	13,546

	Population, 1900	Population, 1910
Sacramento, Cal.	29,282	44,696
Saginaw, Mich.	42,345	50,510
St. Augustine, Fla.	4,272	5,494
St. Joseph, Mo.	102,979	77,403
St. Louis, Mo.	575,238	687,029
St. Paul, Minn.	163,065	214,744
Salem, Mass.	35,956	43,697
Salem, Ore.	4,258	14,094
Salt Lake City, Utah	53,531	92,777
San Antonio, Tex.	53,321	96,614
San Bernardino, Cal.	6,150	12,779
San Diego, Cal.	17,700	39,578
San Francisco, Cal.	342,782	416,912
San José, Cal.	21,500	28,946
San Juan, Porto Rico, 1899	32,048	48,716
Santa Fé, N.M.	5,603	5,072
Sault Ste. Marie, Mich.	10,538	12,615
Savannah, Ga.	54,244	65,064
Schenectady, N.Y.	31,682	72,826
Scranton, Pa.	102,026	129,867
Seattle, Wash.	80,671	237,194
Shawnee, Okla.	3,464	12,474
Sheboygan, Wis.	22,962	26,398
Shenandoah, Pa.	20,321	25,774
Shreveport, La.	16,013	28,015
Sioux City, Iowa	33,111	47,828
Sioux Falls, S.D.	10,266	14,094
Sitka, Alaska	1,396	1,039
Skagway, Alaska	3,117	872
Somerville, Mass.	61,643	77,236
South Bend, Ind.	35,999	53,684
South Omaha, Neb.	26,001	26,259
Spartanburg, S.C.	11,395	17,519
Spokane, Wash.	36,848	104,402
Springfield, Ill.	34,159	51,678
Springfield, Mass.	62,059	88,926
Springfield, Mo.	23,267	35,201
Springfield, Ohio	38,253	46,921
Stamford, Conn.	15,997	25,138
Stockton, Cal.	17,506	23,253
Superior, Wis.	31,091	40,384
Syracuse, N.Y.	108,374	137,249
Tacoma, Wash.	37,714	83,743
Tallahassee, Fla.	2,981	5,018
Tampa, Fla.	15,839	37,782
Taunton, Mass.	31,036	34,259
Terre Haute, Ind.	36,673	58,157
Toledo, Ohio	131,822	168,497
Tonopah, Nev.	——	3,900
Topeka, Kan.	33,608	43,684
Trenton, N.J.	73,307	96,815
Troy, N.Y.	60,651	76,813
Tucson, Ariz.	7,521	13,193
Utica, N.Y.	56,383	74,419
Vicksburg, Miss.	14,834	20,814
Virginia City, Nev.	2,695	2,244
Waco, Tex.	20,686	26,425
Walla Walla, Wash.	10,049	19,363
Waltham, Mass.	23,481	27,834
Warwick, R.I.	21,316	26,629
Washington, D C.	278,718	331,069
Waterbury, Conn.	45,859	73,141
Waterloo, Iowa	12,580	26,693
Watertown, N.Y.	21,696	26,730
Waterville, Me.	9,477	11,458
West Hoboken, N.J.	23,094	35,403
Wheeling, W. Va.	38,878	41,641
Wichita, Kan.	24,671	52,450
Wilkes Barre, Pa.	51,721	67,105
Williamsport, Pa.	28,757	31,860
Wilmington, Del.	76,508	87,411
Wilmington, N.C.	20,976	25,748
Winona, Minn.	19,714	18,583
Woonsocket, R.I.	28,204	38,125
Worcester, Mass.	118,421	145,986
Yonkers, N.Y.	47,931	79,803
York, Pa.	33,708	44,750
Youngstown, Ohio	44,885	79,066
Zanesville, Ohio	23,538	28,026

FOREIGN CITIES MOST OF WHICH ARE MENTIONED IN THE TEXT

	Population
Aachen, Germany, 1910	156,044
Abeokuta, Niger Territory	150,000
Aberdeen, Scotland, 1911	163,084
Acapulco, Mexico	5,000
Adelaide, Australia, 1910	192,000
Adis Ababa, Abyssinia	30,000–35,000
Alexandria, Egypt, 1907	332,246
Algiers, Algeria, 1906	138,240
Amsterdam, Netherlands, 1910	573,983
Antwerp, Belgium, 1910	320,640
Archangel, Russia, 1911	35,000
Arequipa, Peru, 1908	35,000–40,000
Asuncion, Paraguay, 1910	84,000
Athens, Greece, 1907	167,479
Auckland, New Zealand, 1911	102,676
Bagdad, Turkey in Asia	75,000
Bahia. Brazil, 1909	230,000
Baku, Russia, 1904	177,777
Ballarat, Australia, 1910	44,000
Bangkok, Siam, 1909	628,675
Barcelona, Spain, 1911	700,000
Barmen, Germany, 1910	169,201
Basel, Switzerland, 1910	131,914
Batavia, Java, 1905	138,551
Belfast, Ireland, 1910	391,167
Belgrade, Servia, 1910	84,235
Benares, India, 1911	203,804
Bendigo, Australia, 1911	42,000
Berbera, Br. Somaliland	30,000
Bergen, Norway, 1910	76,917
Berlin, Germany, 1910	2,070.695
Berne, Switzerland, 1910	85.264
Bilbao, Spain, 1910	92,514
Birmingham, England, 1910	570,113
Bloemfontein, South Africa, 1911	14,760
Bogota, Colombia, 1910	290,000
Bologna, Italy, 1911	173,639
Bombay, India, 1910	972,892
Bordeaux, France, 1911	261,678
Bradford, England, 1910	295,865
Bremen, Germany, 1910	246,827
Breslau, Germany, 1910	511,891
Brindisi, Italy, 1907	22,021
Brisbane, Australia, 1909	143,077
Bristol, England, 1910	382,550
Brussels, Belgium, 1910	665,806
Bucharest, Roumania, 1908	300,000
Budapest, Austria-Hungary, 1910	880,371
Buenos Aires, Argentina, 1911	1,326,994
Cadiz, Spain, 1910	67,174
Cairo, Egypt, 1907	654,476
Calcutta, India, 1911	1,216,514
Calgary, Canada, 1911	44,000
Callao, Peru, 1908	31,000
Cambridge, England, 1905	38,760
Canton, China	1,600,000
Cape Town, Cape of Good Hope, 1911	67,000
Caracas, Venezuela	72,429
Cardiff, Wales, 1910	199,189
Cartagena, Colombia, 1910	27,000
Cartagena, Spain, 1910	96,983
Catania, Italy, 1911	211,699
Cayenne, French Guiana, 1910	12,426
Cettinje, Montenegro, 1906	4,500
Chemnitz, Germany, 1910	287,807
Christchurch, New Zealand, 1911	80,193
Christiania, Norway, 1910	243,801
Cologne, Germany, 1910	516,167
Colon, Panama, 1910	19,300
Constantinople, Turkey	1,125,000
Copenhagen, Denmark, 1911	462,161
Cordoba, Argentina, 1911	70,380
Cordoba, Spain, 1910	65,160
Cork, Ireland, 1911	76,632
Cuzco, Peru, 1908	10,000–15,000
Damascus, Turkey in Asia	250,000
Danzig, Germany, 1910	170,347
Dawson, Canada, 1901	9,142
Delhi, India, 1911	232,837
Dover, England, 1905	43,734
Dresden, Germany, 1910	546,882
Dublin, Ireland, 1910	402,928
Dundee, Scotland, 1911	165,006
Dunedin, New Zealand, 1911	64,237
Durban, Natal, 1911	31,896
Edinburgh, Scotland, 1911	320,315
Elberfeld, Germany, 1910	170,118
Essen, Germany, 1910	294,629
Fez, Morocco, 1910	140,000
Fiume, Austria-Hungary, 1910	49,806
Florence, Italy, 1911	999,405
Frankfort, Germany, 1910	414,598
Fredericton, Canada, 1901	7,117
Freetown, Sierra Leone, 1910	37,682
Fuchau, China, 1909	624,000
Geneva, Switzerland, 1910	125,520
Genoa, Italy, 1911	272,077
Georgetown, British Guiana, 1908	53,176
Ghent, Belgium, 1910	164,659
Gibraltar, Spanish Pen., 1909	25,915
Glasgow, Scotland, 1910	784,455
Gothenburg, Sweden, 1910	167,813
Granada, Spain, 1910	74,283
Grimsby, England, 1910	74,283
Guatemala, Guatemala, 1910	90,000
Guayaquil, Ecuador, 1910	80,000
Hague, The, Netherlands, 1910	280,515
Halifax, Canada, 1911	46,000
Halle, Germany, 1910	180,551
Hamburg, Germany, 1910	936,000
Hamilton, Bermuda, 1907	2,246
Hamilton, Canada, 1911	82,000
Hammerfest, Norway	2,239
Hangchau, China, 1909	350,000
Hankau, China, 1909	820,000
Hanover, Germany, 1910	302,384
Havana, Cuba, 1910	319,884
Havre, France, 1911	136,159
Hebron, Holy Land	18,000–19,000
Helsingfors, Russia, 1908	137,346
Hobart, Tasmania, 1911	27,719
Hongkong, China, 1908	329,650
Hué, French Ind. China, 1910	50,000
Hull, England, 1909	275,552
Hyderabad, India, 1911	500,623
Iquique, Chile, 1907	40,171
Irkutsk, Siberia, 1908	108,060
Jaffa, Holy Land	45,000
Jerusalem, Holy Land, 1910	70,000
Johannesburg, Transvaal, 1910	158,580
Kabul, Afghanistan	60,000
Khartum, Egyptian Sudan, 1909	20,956
Khelat, Baluchistan	14,000
Kiev, Russia, 1909	468,712
Kimberley, Cape of Good Hope, 1911	13,656
Kingston, Canada	17,961
Kingston, Jamaica, 1911	57,379
Kioto, Japan, 1908	442,462
Königsberg, Germany, 1910	245,853
Krefeld, Germany, 1910	129,412
Kumassi, Ashanti, 1910	7,000
La Guaira, Venezuela	8,000
La Paz, Bolivia, 1909	78,856
La Plata, Argentina, 1911	100,608
Lassa, Tibet	15,000–20,000
Leeds, England, 1910	490,985
Leghorn, Italy, 1908	108,000
Leicester, England, 1910	248,374
Leipzig, Germany, 1910	587,635

	Population
Leith, Scotland, 1911	80,489
Libreville, French Congo	3,000
Liege, Belgium, 1910	174,768
Lille, France, 1911	217,807
Lima, Peru, 1908	140,884
Limoges, France, 1911	92,181
Lisbon, Portugal, 1900	356,009
Liverpool, England, 1910	767,606
Loanda, Port. W. Africa	14,000
Lodz, Russia, 1908	393,526
London, Canada, 1911	46,000
London, England, 1910	4,872,702
London, Greater, 1910	7,537,196
Lourenço Marquez, Port. E. Africa, 1908	9,849
Lucerne, Switzerland, 1910	39,152
Lucknow, India, 1911	259,798
Lyon, France, 1911	523,796
Madras, India, 1911	518,660
Madrid, Spain, 1910	571,539
Magdeburg, Germany, 1910	279,685
Malaga, Spain, 1910	133,045
Manaos, Brazil, 1909	50,000
Manchester, England, 1910	716.354
Mandalay, Burma, 1910	138,299
Marseille, France, 1911	550,619
Maskat, Oman, 1907	25,000
Mecca, Turkey	80,000
Melbourne, Australia, 1910	591,830
Messina, Italy, 1911	126,172
Metz, Germany, 1910	68,667
Mexico City, Mexico, 1910	470,659
Milan, Italy, 1911	599,200
Mocha, Turkey in Asia	5,000
Mombasa, Br. E. Africa, 1910	30,000
Monrovia, Liberia, 1908	8,000
Montevideo, Uruguay, 1909	291,465
Montreal, Canada, 1911	466,000
Morocco, Morocco	50,000
Moscow, Russia, 1909	1,481,200
Munich, Germany, 1910	595,053
Nogoya, Japan, 1908	378,231
Naples, Italy, 1911	723,208
Nassau, Bahama, 1910	12,534
Nazareth, Holy Land	11,000
Newcastle, England, 1911	266,671
Nice, France, 1911	142,940
Nizhni Novgorod, Russia, 1904	92,273
Nottingham, England, 1910	266,471
Nuremberg, Germany, 1910	332,651
Odessa, Russia, 1909	478,900
Oporto, Portugal, 1900	167,955
Osaka, Japan, 1908	1,226,590
Ottawa, Canada, 1911	86,000
Oxford, England, 1910	53,220
Palermo, Italy, 1911	314,656
Panama, Panama, 1909	40,801
Para, Brazil	65,000
Paramaribo, Dutch Guiana, 1909	34,795
Paris, France, 1911	2,846,986
Peking, China	1,600,000
Pernambuco, Brazil, 1906	150,000
Perth, West Australia, 1908	54,854
Peterborough, Canada, 1901	11,239
Petrograd Russia, 1910	1,907,708
Pietermaritzburg, Natal, 1911	30,539
Piræus, Greece, 1907	73,579
Pisa, Italy, 1911	65,215
Port Arthur, Canada, 1901	3,214
Port Arthur, China	——
Port au Prince, Haiti, 1908	100,000
Port Said, Egypt, 1907	49,884
Portsmouth, England, 1910	217,989
Posen, Germany, 1910	156,696
Potsdam, Germany, 1910	62,224
Prague, Austria-Hungary, 1910	223,741
Pretoria, Transvaal, 1910	48,609
Puebla, Mexico, 1910	101,214
Quebec, Canada, 1910	78,000
Queenstown, Ireland	9,082
Quito, Ecuador, 1909	70,000
Rangoon, Burma, 1911	289,432
Rheims, France, 1911	115,178
Riga, Russia, 1908	318,400
Rio de Janeiro, Brazil, 1909	1,000,000
Rome, Italy, 1911	538,634
Rosario, Argentina, 1909	176,076
Rotterdam, Netherlands, 1909	417,780
Roubaix, France, 1906	121,017
Rouen, France, 1906	118,459
St. Etienne, France, 1906	146,788
St. John, Canada, 1911	42.000
St. John's, Newfoundland, 1911	31,501
Samarkand, Russian Turkestan, 1905	66,166
San Luis Potosi, Mexico, 1910	82,946
San Salvador, Salvador, 1906	59,540
Santiago, Chile, 1907	332,724
Santo Domingo, Santo Domingo, 1909	18,626
Santos, Brazil, 1909	35,000
São Paulo, Brazil, 1909	400,000
Seoul, Korea, 1911	278,958
Seville, Spain, 1910	155,366
Sèvres, France	6,902
Shanghai, China	1,000,000
Sheffield, England, 1910	478,763
Siangtan, China, 1908	1,000,000
Singanfu, China, 1908	1,000,000
Singapore, Straits Settlements, 1911	311,985
Smyrna, Turkey, 1910	350,000
Sofia, Bulgaria, 1910	102,769
Southampton, England, 1910	127,157
Stettin, Germany, 1910	236,145
Stockholm, Sweden, 1910	341,986
Strassburg, Germany, 1910	178,290
Stuttgart, Germany, 1910	285,589
Suchau, China, 1908	500,000
Sucre, Bolivia, 1909	23,416
Suez, Egypt, 1910	18,347
Swansea, Wales, 1910	98,817
Sydney, Australia, 1910	621,100
Tampico, Mexico	9,885
Tananarivo, Madagascar, 1909	94,810
Tangier, Morocco, 1901	35,003
Tashkend, Russian Turkestan, 1904	164,740
Teheran, Persia, 1905	280.009
Tiberias, Holy Land, 1905	5,000
Tientsin, China, 1910	1,000,000
Tiflis, Russia, 1904	196,935
Timbuktu, Sudan	20,000
Tokyo, Japan, 1908	2,186,079
Toronto, Canada, 1911	376,000
Trebizond, Turkey in Asia	51,000
Trieste, Austria-Hungary, 1910	229,475
Tripoli, Tripoli, 1909	30,000
Trondhjem, Norway, 1910	45,228
Tunis, Tunis, 1906	227,519
Turin, Italy, 1911	427.733
Upernivik, Greenland	700
Valencia, Spain, 1910	233,348
Valparaiso, Chile, 1907	162,447
Vancouver, Canada, 1911	100,000
Venice, Italy, 1911	160,727
Vera Cruz, Mexico, 1910	29,164
Versailles, France, 1911	60,458
Victoria, Canada, 1911	32.000
Vienna, Austria-Hungary, 1911	2,004,291
Vladivostok, Siberia, 1909	90,162
Warsaw, Russia, 1909	781,179
Wellington, New Zealand, 1911	70,729
West Ham, England, 1910	328.585
Windsor, Canada, 1901	12,153
Winnipeg, Canada, 1911	185,000
Wuchang, China	300,000
Yakoba, Niger Terr.	50,000
Yarmouth, Canada, 1901	6,420
Yokohama, Japan, 1908	394,303
Zanzibar (British), 1910	35,262
Zurich, Switzerland, 1910	189,088

ELEVATION OF SOME PLATEAUS AND MOUNTAIN PEAKS

	Feet
Abyssinian Plateau	5–7,000
Aconcagua, Andes, Argentina (highest in South America)	22,860
Apo, Mindanao, Philippines	10,312
Ararat, Turkey in Asia	17,325
Mt. Blanc, Alps, France (highest in Alps)	15,781
Bolivian Plateau	10–13,000
Brazilian Plateau	2–2,500
Chimborazo, Andes, Ecuador	20,498
Cotopaxi, Andes, Ecuador	19,613
Elbruz, Caucasus, Russia	18,200
Etna, Sicily	10,835
Everest, Himalayas, Nepal (highest known in the world)	29,002
Fremont Peak, Rocky Mountains, Wyo.	13,790
Fujiyama, Japan	12,365
Hecla, Iceland	5,110
Kunchinjunga	28,156
Kenia, Africa	18,620
Kilimanjaro, Africa (highest known in Africa)	19,780
Kosciusko, Australia (highest in Australia)	7,336
Logan, Coast Ranges, Canada (highest known in Canada)	19,539
McKinley, Alaska (highest known in North America)	20,464
Mauna Kea, Hawaiian Islands	13,805

	Feet
Mauna Loa, Hawaiian Islands	13,675
Mayon, Luzon Island, Philippines	8,900
Mexican Plateau	5–6,000
Mitchell, Appalachian Mts., N.C. (highest in Eastern U.S.)	6,711
Mt. Marcy, New York	5,344
Mt. Tina, Haiti	10,300
Orizaba, Mexico (highest in Mexico)	18,314
Pico del Turquino, Cuba	8,600
Pike's Peak, Rocky Mountains, Colorado	14,111
Popocatepetl, Mexico	17,798
Rainier, Cascade Mountains, Washington	14,363
St. Elias, Alaska	18,025
San Francisco Mountain, Arizona	12,794
Shasta, Cascade Mountains, California	14,380
Tibet Plateau	10–15,000
United States, Western Plateau	5–6,000
Vesuvius, Italy	4,200
Washington, White Mountains, N.H. (highest in Northeastern U.S.)	6,279
Whitney, Sierra Nevada, California (highest in Western U.S.)	14,502
Yunque, Porto Rico	3,609

SOME OF THE LARGEST RIVERS OF THE WORLD

	Length in Miles	Basin Area Sq. Miles	Ocean
North America			
Arkansas	2,170	185,671	Atlantic
Colorado	2,000	225,049	Pacific
Columbia	1,400	216,537	Pacific
Mackenzie	2,000	590,000	Arctic
Missouri	3,000	527,155	Atlantic
Missouri-Mississippi	4,300	1,257,000	Atlantic
Nelson	1,732	432,000	Atlantic
Ohio	975	201,720	Atlantic
Rio Grande	1,800	240,000	Atlantic
St. Lawrence	2,200	530,000	Atlantic
Yukon	2,000	440,000	Pacific
South America			
Amazon	3,300	2,500,000	Atlantic
Orinoco	1,350	366,000	Atlantic
Plata	2,580	1,200,000	Atlantic
São Francisco	1,800	200,000	Atlantic
Europe			
Danube	1,770	300,000	Atlantic
Dneiper	1,200	242,000	Atlantic
Dwina	1,000	140,000	Arctic
Elbe	725	55,000	Atlantic
Po	400	27,000	Atlantic
Rhine	800	75,000	Atlantic
Rhone	500	38,000	Atlantic

	Length in Miles	Basin Area Sq. Miles	Ocean
Europe			
Seine	482	30,300	Atlantic
Thames	228	6,100	Atlantic
Volga	2,400	563,300	Caspian
Asia			
Amur	2,800	520,000	Pacific
Brahmaputra	1,800	425,000	Indian
Ganges	1,500	440,000	Indian
Hoang-ho	2,700	570,000	Pacific
Indus	1,800	372,700	Indian
Irawadi	1,500	158,000	Indian
Lena	2,800	950,000	Arctic
Mekong	2,800	280,000	Pacific
Ob	3,200	1,000,000	Arctic
Yangtse-kiang	3,200	548,000	Pacific
Yenisei	3,000	1,500,000	Arctic
Africa			
Congo	2,900	1,200,000	Atlantic
Niger	2,600	563,300	Atlantic
Nile	3,400	1,273,000	Atlantic
Zambezi	1,500	600,000	Indian
Australia			
Darling	1,100	——	Indian
Murray	1,000	270,000	Indian

SOME OF THE LARGE LAKES OF THE WORLD

	Area in Sq. Miles	Elevation in Feet	Greatest Depth in Feet
Aral Sea	26,900	160	225
Baikal	12,500	1,312	4,550
Balkash	7,800	780	70
Caspian	169,000	— 85[1]	2,400
Chad, variable with season	10,000 and often more	800–900	12
Dead Sea	370	— 1,310[1]	1,330
Erie	9,990	573	210
Great Bear Lake	11,200	200	——
Great Salt Lake	2,360	4,218	30–50
Great Slave Lake	10,100	——	over 650

[1] Below sea level.

	Area in Sq. Miles	Elevation in Feet	Greatest Depth in Feet
Huron	22,322	582	750
Ladoga	7,000	60	730
Manitoba	1,850	810	——
Michigan	21,729	582	870
Nicaragua	3,600	110	83
Nyassa	14,000	1,500	600 +
Ontario	7,104	247	738
Superior	30,829	602	1,008
Tanganyika	12,650	2,800	2,100
Titicaca	3,300	12,875	700
Victoria Nyanza	30,000	4,000	590 +
Winnipeg	9,400	710	70

DISTRIBUTION OF MANKIND

Mongolians	**540,000,000**
China	380,000,000
Japan and Korea	55,000,000
Indo-China	35,000,000
Malaysia	30,000,000
Other Mongolians	40,000,000

Caucasians	**770,000,000**
Europe	355,000,000
Asia	280,000,000
America	115,000,000
Africa	15,000,000
Australasia	5,000,000

DISTRIBUTION OF MANKIND

Ethiopians	**173,000,000**
Africa and Madagascar	153,000,000
North and South America	20,000,000
American Indians	**22,170,000**
Mexico	8,765,000
Brazil	4,200,000
Colombia	3,150,000
Peru	2,700,000
Bolivia, Guatemala, and Venezuela	4,225,000
United States	250,000
Canada	100,000

RELIGIONS OF MANKIND

Buddhists and Brahmins	650,000,000
Christians	440,000,000
Jews	8,000,000
Mohammedans	180,000,000
Pagans and others	250,000,000

PRINCIPAL COUNTRIES FROM WHICH THE FOREIGN-BORN POPULATION OF THE UNITED STATES HAS COME

Country of Birth	Number in 1910
Austria-Hungary	258,737
Italy	215,537
Russian Empire	186,792
British North America	56,555
England	46,706
German Empire	31,283
Ireland	29,855
Greece	25,888
Sweden	23,745
Scotland	20,115

DISTRIBUTION OF NEGROES IN THE FIFTEEN STATES WHERE THEY ARE MOST NUMEROUS

States	Number of Negroes in 1900	Percentage of Negroes to Total Population, 1900
1. Georgia	1,034,818	46.69
2. Mississippi	907,630	58.50
3. Alabama	827,307	45.24
4. South Carolina	782,321	58.36
5. Virginia	660,722	35.63
6. Louisiana	650,804	47.10
7. North Carolina	624,469	32.97
8. Texas	620,722	20.36
9. Tennessee	480,243	23.77
10. Arkansas	366,856	27.97
11. Kentucky	284,706	13.25
12. Maryland	235,064	19.75
13. Florida	230,730	43.65
14. Missouri	161,234	5.18
15. Pennsylvania	156,845	2.48

Total number of Negroes in 1900, 8,840,789.

INDEX AND PRONOUNCING VOCABULARY

KEY TO PRONUNCIATION

(Webster's International Dictionary)

ā, as in āle ; ā̍, as in sen′ā̍te ; â, as in câre ; ă, as in ăm ; ä, as in ärm ; ȧ, as in ȧsk ; *a*, as in fi′n*a*l ; ạ, as in ạll ; ē, as in ēve ; ē̍, as in ē̍-vent′ ; ĕ, as in ĕnd ; ẽ, as in fẽrn ; *e*, as in re′*c*ent ; ī, as in īce ; ī̍, as in ī̍-de′a ; ĭ, as in ĭll ; ō, as in ōld ; ō̍, as in ō̍-bey′ ; ô, as in ôrb ; ŏ, as in ŏdd ; ū, as in ūse ; ū̍, as in ū̍-nite′ ; ṳ, as in rṳde ; ụ, as in fụll ; ŭ, as in ŭp ; û, as in ûrn ; ȳ̆, as in pit′ȳ̆ ; o͞o, as in fo͞od ; o͝o, as in fo͝ot ; ou, as in out ; oi, as in oil ; ɴ, representing simply the nasal tone of the preceding vowel, as in ensemble (äɴ′säɴ′b'l), ' (for voice glide) as in pardon (pär′d'n); g (hard), as in go ; s (sharp), as in so ; z (like s sonant), as in zone ; ch (= tsh), as in chair ; sh, for ch, as in machine ; zh (= sh made sonant), for z, as in azure ; j (= dzh), for g, as in gem ; k, for ch, as in chorus ; kw, for qu, as in queen ; ks (surd), for x, as in vex ; gz (sonant), for x, as in exist ; f, for ph, as in philosophy ; hw, for wh, as in what ; t, for ed, as in baked ; ng, as in long ; n̲ (like ng) for n before the sound of k or hard g, as in bank ; n (ordinary sound), as in no ; th̶ (sonant), for th, as in then ; th (surd), as in thin.

The primary accent is indicated by a short, heavy mark (′), the secondary by a lighter mark (′).

The numbers refer to pages. Where several references are given, the pages on which the principal description is to be found are indicated by heavier type.

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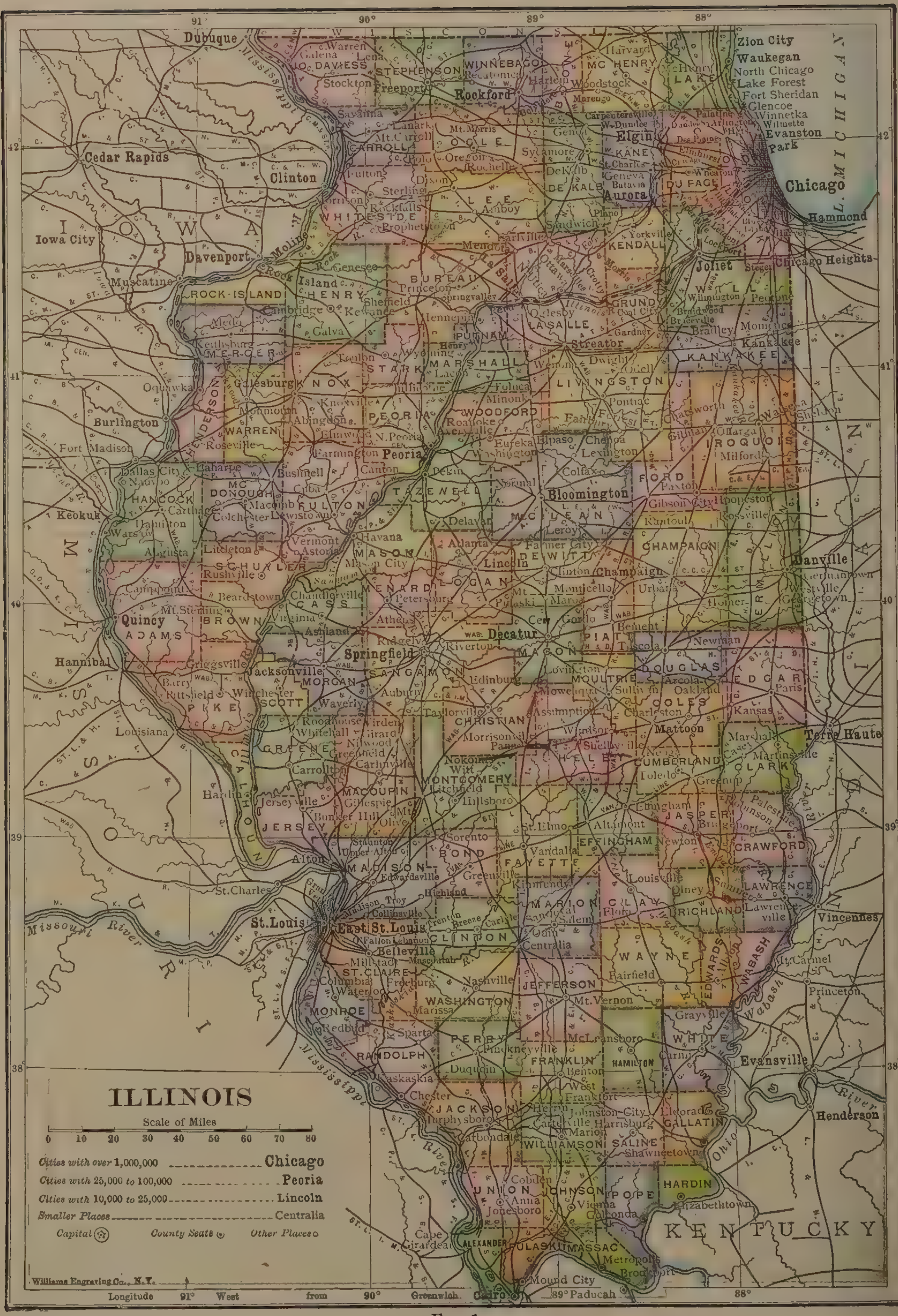

ILLINOIS
Scale of Miles
0 10 20 30 40 50 60 70 80
Cities with over 1,000,000 — Chicago
Cities with 25,000 to 100,000 — Peoria
Cities with 10,000 to 25,000 — Lincoln
Smaller Places — Centralia
Capital
County Seats
Other Places
Williams Engraving Co., N.Y.
Longitude 91° West from 90° Greenwich 89° 88°

FIG. 1.

ILLINOIS

BY FRANK W. DARLING, FORMERLY HEAD OF DEPARTMENT OF GEOGRAPHY,
CHICAGO NORMAL SCHOOL

REVISED BY J. W. LARGE, JOLIET, ILL.

I. A GENERAL VIEW

United States Relief Map Questions. — On the relief map of the United States find the junction of the Mississippi and Ohio rivers.

Relief. — Illinois is called the "Prairie State" because, in the main, it has a broad, flat, nearly treeless surface. It is not level, however, like the great plains farther west, but is gently rolling, with gradually sloping hills and broad, shallow valleys. The relief map shows that in the northwestern corner of the state there are some very high, rugged hills. This is the highest part of the state. Another line of hills runs across the southern part of the state from the Mississippi River to the Ohio. These rise abruptly from the low land north of them. On the south they slope gradually down to the Ohio River. This southern line of hills is an extended spur of the Ozark Mountains. (Where are the Ozark Mountains?)

In the central part of the state, between these elevated extremities, is a depression which on the relief map looks like a great scar extending in a southwesterly direction almost across the state from Lake Michigan to the Mississippi River. This is the broad and deep valley of the largest and most important river in the state, the Illinois River. You will observe that this valley is separated from Lake Michigan by a low ridge of land, which extends across the northeast corner of the state, following the same curve as the shore line.

This ridge forms the divide which naturally kept the water of Lake Michigan from flowing out through the Illinois River, and it was this ridge that had to be cut through in making the Chicago Drainage Canal. (See page 7.) You will have to look closely at the map to see a broader ridge running parallel with this divide in a broken crescent-like slope from the eastern side of the state to the northern boundary, through which the Illinois River has cut a channel. There is still another ridge, narrower and shorter, but having the same general slope, which lies still farther south, through the middle of which the Embarras River has cut a channel. (Find each of the rivers named.)

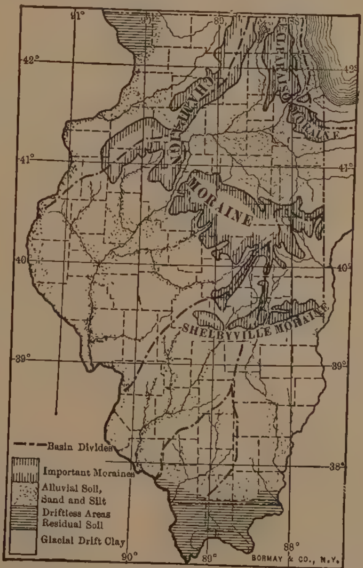

FIG. 2. — Divides, moraines, and soils of Illinois.

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These ridges are heaps of earth, piled up as though some great force had scraped the soil out of the bottom of Lake Michigan and left it massed in these long mounds. All the rivers flow away from these ridges, showing that the surface of the state slopes generally towards the south.

In what direction do the rivers flow which are tributary to the Mississippi? In what direction do the branches of the Wabash flow? Find a small river which flows northeast from these ridges into Lake Michigan.

Rivers. — Illinois is naturally divided into seven great drainage areas. Each has its special characteristics of soil, products, and industries, and has developed more or less independently of its neighboring areas.

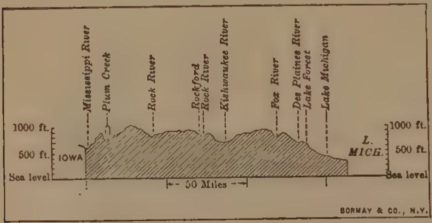

Fig. 3. — Section of Illinois east and west through Rockford.

For the most part these areas are river basins which lie wholly within the state, and are separated from adjacent basins by divides which can be traced on the relief map.

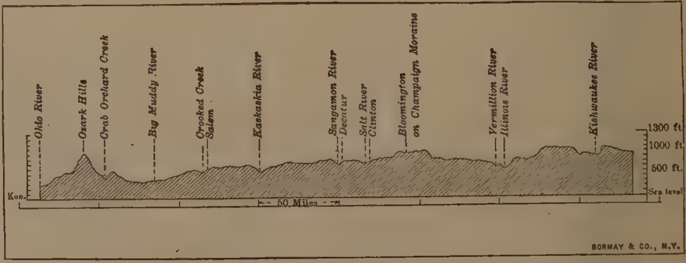

Fig. 4. — Section of Illinois on the 89th meridian, showing topographical features of surface and height above sea level.

Two of these areas, however, are only parts of great slopes which lie mainly outside the state, but which extend into Illinois; the northeastern part of the state is but a small part of the Great Lakes and St. Lawrence Basin. This small portion of the state is called the "Chicago Plain," and is drained by small streams like the Chicago and Calumet rivers. That part of the state lying south of the southern ridge of hills is part of the Ohio River Basin and drains into the Ohio by short streams.

Trace the divides which separate these other basins — the Rock River Basin; the Illinois River Basin; the Kaskaskia River Basin; the Big Muddy River Basin; the Wabash River Basin. Notice the slope of each basin and where the river rises in relation to these highlands you have studied. (See Figs. 1 and 2.)

The Mississippi River has worn a deep valley along the western boundary, so that the general level of the state is much above that of the river, which is bordered by high and abrupt bluffs. Between the bluffs and the river is a low strip of land, very level and but a few feet above the water. This land is apt to be flooded when the river is high; it is called the Mississippi Flood Plain. This level strip is from one to six miles wide.

The United States map shows that nearly all of the rivers of the surrounding states flow toward Illinois. This is because Illinois is in the center of the immense trough between the great mountain systems of the East and the West. (See page 5, Second Book.) The average elevation of Illinois above sea level is about 600 feet. This is fully 100 feet lower than the average height of Indiana and 450 feet lower than the average level of Wisconsin.

The Soil and Bed Rock. — Wherever you live in Illinois, the surface of the land is covered with a fine-grained soil, which has resulted from the grinding and the decay of rock. On the surface this soil is generally black or dark colored, because the rock particles are mixed with bits of decaying vegetation. Underneath this dark covering is usually found some lighter colored soil, which has little or no decayed vegetation in it. This under soil differs greatly in different parts of the state; and in most places there are several kinds of subsoil found in layers, one above the other. It may be clay, gravel, sand, silt, or residual soil. When the subsoil is dug through, as in making a well, laying a foundation, or digging a mine, it is found to lie on top of a bed of solid rock. This rock generally lies in thick layers. At many places, where the rock crops out at the surface, or where the rivers have worn through the soil and exposed it, this bed rock can be seen without digging. At other places in the state the soil is so deep that wells are very seldom dug to the bed rock. This bed rock may commonly include limestone, sandstone, shale, and coal. These are all stratified rocks, indicating that they must have been made by being deposited as sediments in water, when the sea covered this region.

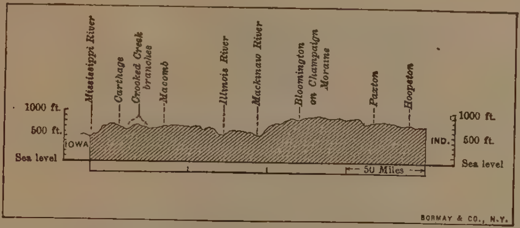

FIG. 5.—Section of Illinois east and west through Bloomington, showing topographical features of surface and height above sea level.

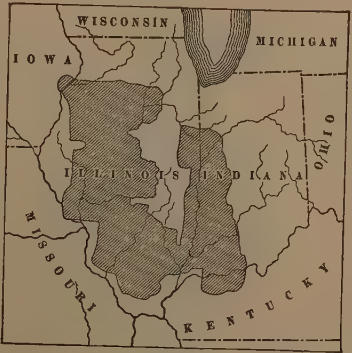

FIG. 6.—Coal areas of Illinois and Indiana.

The pupils should be encouraged to investigate the soils and the bed rock of the home region, identifying them and noting the order and place of occurrence. (See Appendix, for description of soils.)

Most of Illinois lies in that region of North America which, during the coal period, was many times raised and lowered, and for ages lay just above the water, when great swamps occupied the land. Each time the swamps sank below the water, a new layer of plant life was buried (see page 2, Second Book), so that in the bed rock of two-thirds of Illinois coal can be mined (Fig. 6). The layers of coal vary in thickness from a few inches to several feet. In places, as many as sixteen layers of coal are found.

On the map showing the coal region of Illinois you will see that coal is found mainly in the central area of the state. In some places the rivers have worn their valleys down through the bed rock, exposing the ends of the coal seams. In such places the coal is easily mined by "drift mining"; but over most of the state the coal is covered entirely by layers of rock and soil, and there shafts have to be sunk. (See page 55, Second Book.)

Effect of the Great Ice Sheet.—The great American ice sheet, passing along the trough of Lake Michigan and the lowland of central Illinois, extended there much farther south than anywhere else in the United States. (See Fig. 18, Second Book.) It did not extend over the whole state, however, but melted just before reaching the hills, in the southern part of the state. For some reason the highland in the northwestern part of the state was never covered. This part of the great ice sheet formed in what is now the Dominion of Canada, northeast of Illinois, and pushed out its edge, slowly breaking off rock fragments, grinding them under its heavy bulk, and using them to scratch the surface of the land, as though a great piece of sandpaper had rubbed over this north country for years. The soil that covered this region before the glacial period was pushed along with the ice, elevated rocks were worn down, and bed rock was scratched and grooved.

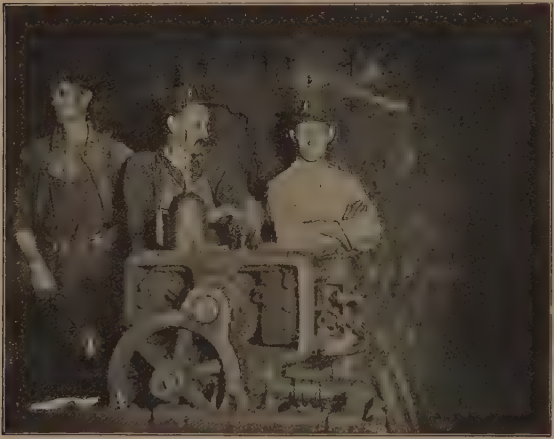

Fig. 7.—In a mine, showing a thick vein of coal.

In the southern part of Illinois the climate was warm enough to melt the ice as fast as it pushed south. Where the ice melted, it left the soil and the rocks it had been carrying, heaped up in long hill-like ridges called *moraines*. This great quantity of melting ice made more water than the rivers had been used to carrying, and the great flood thus caused carried with it loads of soil and rock, which had been brought south by the ice. This soil was deposited along the bottoms of rivers, and when the rivers shrank to their former size, the silt was left, forming level flood plains like those along the Mississippi. The ice sheet melted gradually, and as its front retreated toward the north, it left the surface over which it had rested covered with a mixed soil called *drift*. This drift is composed of the fine clay soil the ice had made by grinding up the rocks it passed over, and it contains many large and small pieces of rock.

It seems that there must have been at least two of these ice sheets which partly covered Illinois. The earlier is the one we have described as extending to the Ozark Hills. The last one covered only the northeastern part of the state. Where this latter ice sheet stopped it left the most southern moraine ridge noticeable on the relief map of Illinois. This is called the "Shelbyville Moraine." (See Fig. 2.) Retreating still farther north, it stopped and built up the broad middle ridge through which the Illinois River has cut. This is called the "Champaign Moraine." At the last stop of the ice sheet in this region, the divide between Lake Michigan and the Illinois River Basin was deposited. This is called the "Valparaiso Moraine."

In all that part of the state once covered by the ice sheet the land is rolling, with gradually sloping hills and with shallow valleys between. The soil on top of these hills and in the very shallow valleys is usually drift clay which was left by the glacier, but which has now become darkened on the surface by decaying vegetation. The drift soil is easily worn away when the water runs over it, and for this reason the many rivers of the state have the general characteristic of wide valleys, with broad flood-plains of silt and sand soil along their courses.

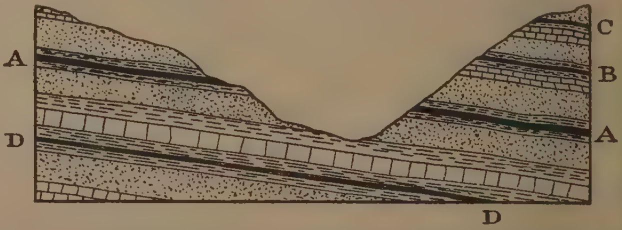

Fig. 8.—An ideal section across an eroded valley in the coal measures. *A*, *B*, *C*, and *D* represent coal seams. Which of these seams can be mined by drift mining? By shaft mining?

This is not true of those areas in the southern and northwestern parts of the state, where there is no drift. In these regions the bed rock comes near the surface, being covered only by a thin residual soil formed by the decay of rock underneath. Streams cut slowly through this limestone bed, and the valleys are narrow and deep, without flood-plains. Such valleys are called *cañons*, and are plentiful in the non-glaciated areas of the state. This wearing away of the rock makes rugged, precipitous hills, very different from the rolling prairie land of the rest of the state.

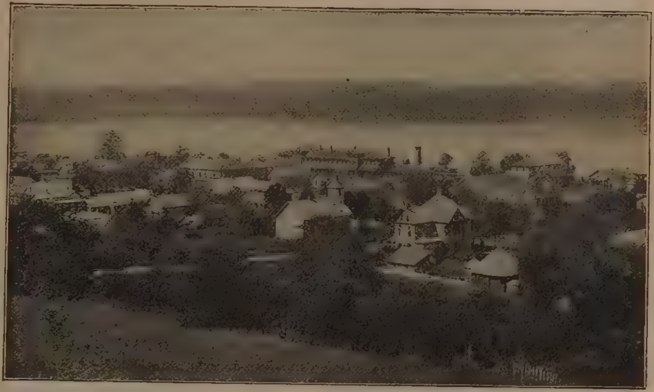

FIG. 9.—A river and its flood plain in the glaciated region. (Thebes, Illinois.)

These various soils and their elevation determine very largely what kinds of crops can best be grown in the different regions. *Wheat* grows best in the silt soil in the valleys, where it does not dry out too rapidly, or in the old lake and swamp bottoms left between the moraines where silt was deposited when the lake covered the land. *Corn* grows in such places too, but it grows well also on the higher clay soil where wheat raising is not profitable. So much of the soil of Illinois is of the latter description, that corn is the largest crop in the state, and Illinois ranks first among the corn-producing states. Grass grows well on these highlands and makes good *hay*. Where corn and hay crops abound, *cattle* and *hogs* are always profitably raised. The value of the *farm animals* of Illinois is greater than that of any other state except Iowa. (See Figs. 260, 261, 262, 264, Second Book.)

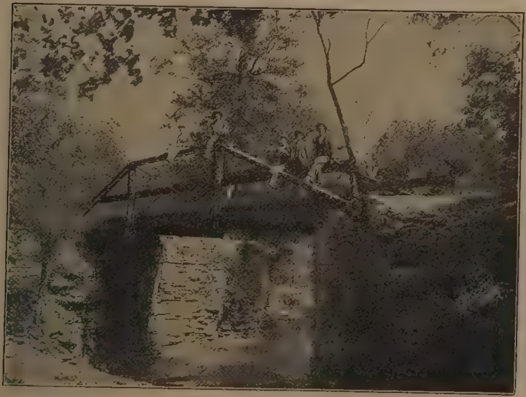

FIG. 10.—Characteristic river valley in the non-glaciated region near Rock Springs, Illinois.

Trees grow in Illinois wherever they are planted, yet the vast rolling prairies are almost destitute of trees. As a rule, trees are to be found only in the valleys bordering streams, but now and then a grove of old trees will be found in a protected place on the higher land.

The growth of *fruit* is more dependent upon the climate than upon the soil. Fruit is usually raised upon slopes of land where good air and drainage can be had. The north and south slopes from the Ozark Hills are well fitted for fruit culture, and it is mainly due to social conditions that more fruit is not raised here.

Climate. — Although the state is far from level, there are no surface elevations within its borders that are of sufficient height to have much effect upon its climate.

For a little time each year Illinois is more directly under the sun than the equator is at that time, and then it is usually warmer than the average temperature at the equator. (What time of the year is this?) On the other hand, when our days are shortest it is colder than it is in summer as far north as man has gone. If a record of the temperature in the center of the state were kept for every hour throughout the year, the average would be about 53 degrees, but the thermometer has registered as high as 106 degrees and as low as 22 degrees below zero. Most of the storms that reach Illinois have come over the Rocky Mountains and have swept over the great plains. These broad, unprotected plains are warmed and cooled rapidly, so that winds blowing over them may be very hot at one time and very cold at another. This accounts in a great measure for the sudden changes in temperature and weather in Illinois.

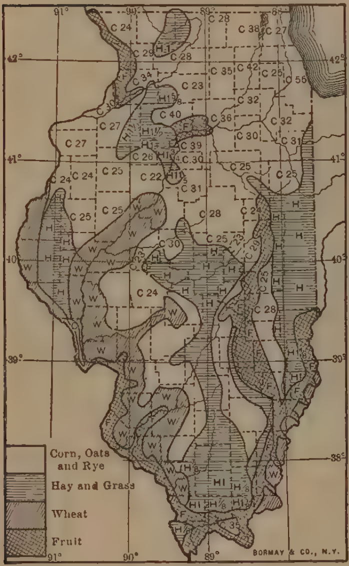

FIG. 11. — Map showing proportional distribution and regions best fitted for raising chief agricultural products.

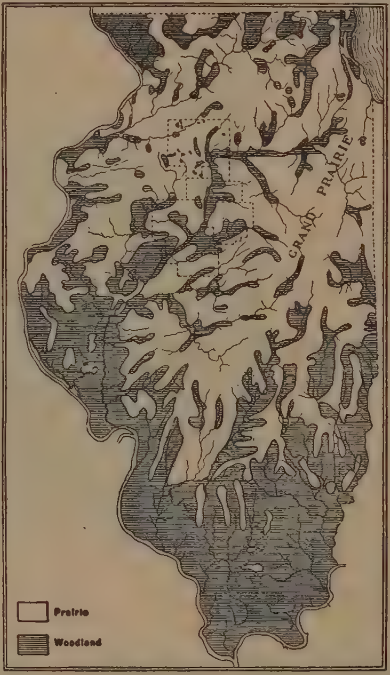

FIG. 12. — Map showing distribution of prairie and woodland.

As the result, the northern part of the state has severe winters with sudden changes of temperature, as compared with the southern part.

Between the two sections a seasonal difference of about three weeks exists. The average difference in annual temperature between the extreme north and the extreme south is about 11 degrees.

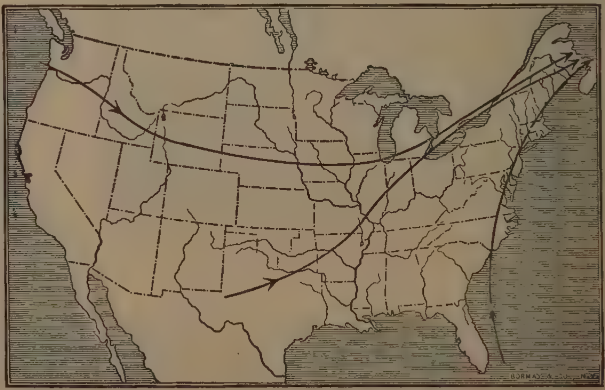

FIG. 13. — The usual storm tracks in the United States and their relation to northern and southern Illinois.

The last killing frost seldom comes later than April 1 in the southern section, while north of the 41st parallel it may be expected as late as April 23.

Southern Illinois receives about 10 inches more rain during the year than the northern part of the state. The average rainfall for the whole state during one year is about 38 inches. The region just west of the lake receives an increased rainfall, due to its nearness to the water body. The climate of the entire state is such as to make it exceedingly productive. There is no place which is arid.

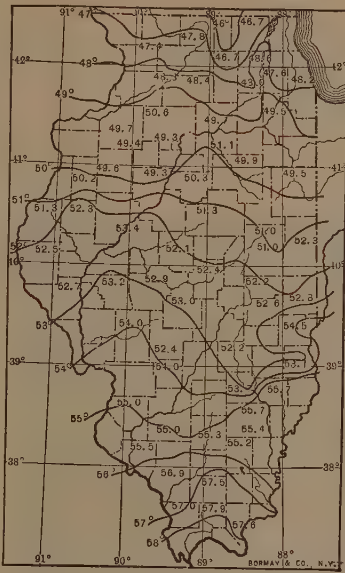

FIG. 14. — Average annual temperatures in Illinois.

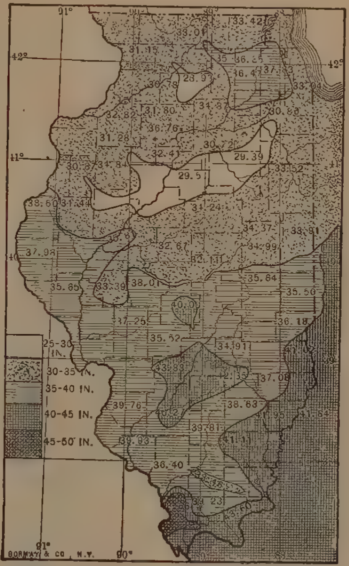

FIG. 15. — Average annual rainfall in Illinois.

II. Physiographical Regions

Lake Michigan Drainage Region. The Chicago Plain. — The northeastern part of the state which drains into Lake Michigan, and which is separated by the Valparaiso moraine from the great Mississippi Basin, has a peculiar formation due to the effects of the ice sheet.

After the ice sheet had remained for many years with its front piling up the drift that made the Valparaiso moraine, it melted slowly away until its front rested across Lake Michigan. The water could not run from the lake north as it does now, for the northern outlet was filled by the ice sheet. The water rose over the land until it reached the top of the moraine, then it flowed over the lowest part in the moraine (640 feet above the sea level), and cut a channel to the Illinois River, and then flowed in a great stream diagonally across the state to the Mississippi River. So it happened that for many years the Chicago plain, where Chicago now stands, was the level bottom of the lake. As the ice sheet melted back farther north, the water of the lake gradually fell, leaving the old bottom, with sandy beaches, exposed as lowland. (See Figs. 16 and 17.) After the lake fell too low to flow through its old outlet, a small river ran from the top of the Valparaiso moraine across the state to help form the Illinois River. This is called the Des Plaines River. The low, crescent-shaped Chicago plain then drained off into Lake Michigan through the Chicago River (one branch of which rose in the old channel of the former outlet of the lake). Thus there was left but a short distance, about a mile, of lowland between the Des Plaines and Chicago rivers, to separate the waters of Lake Michigan from its old outlet into the Illinois River. In 1900 the Chicago Sanitary Canal was dug through this lowland, so that now the waters of Lake Michigan flow through the old outlet.

All of the state, except this little northeast corner, lies in the great Mississippi Basin; that is, all of the other rivers of the state are naturally tributary to the Mississippi River. **The Illinois River Basin** is by far the largest of the state. It extends diagonally across the state from the Valparaiso moraine to the Mississippi River.

North of the Illinois River, Grass and Fox lakes, near the state line, are remains of the old glacial lakes in this region and are drained by the Fox River. The divide between the Illinois Basin and the Rock River Basin on its north is the highest divide in the state, averaging 850 feet above the sea level. In one place, where the Big Bureau River flows, the divide is very low, and the Mississippi may have at one time flowed through here into the Illinois River. This large stream left a rich soil covering the surface, which makes the region around the Bureau River the most productive in the state. It is through this region that the "Hennepin Canal," which connects the Illinois and Mississippi rivers, passes.

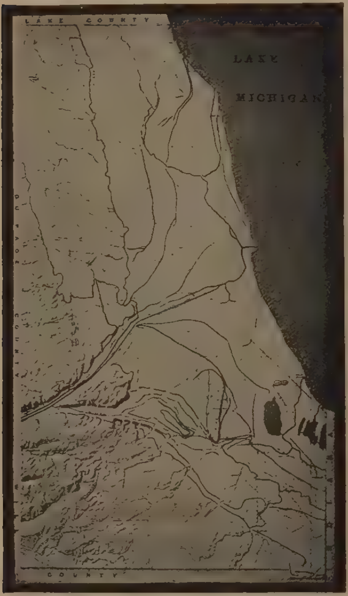

FIG. 16.—The Chicago Plain as it exists to-day, showing the level land left by the retreat of the water.

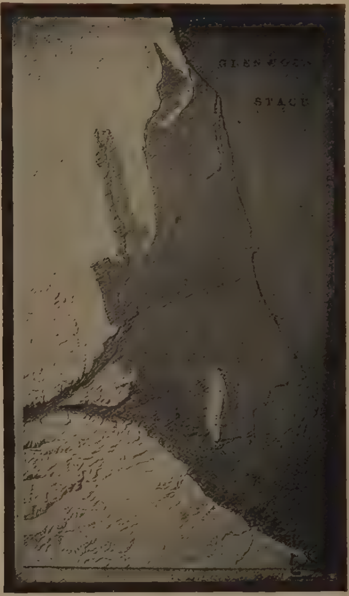

FIG. 17.—The Chicago Plain, showing the lake covering the present site of Chicago.

Below the Champaign moraine, the Illinois River Valley suddenly widens so that in places it is 18 miles wide. This large flood plain, covered with its rich silt, makes rich farm land. The Sangamon River drains more Illinois land than any other branch of the Illinois River. The soil of this Sangamon region is glacial drift except where silt and sand have been deposited in the flood plains. The last quarter of the Illinois River flows almost directly south, nearly parallel to the Mississippi River, for 60 miles, before it finds a place to get around the limestone ridge which lies along the western border of the state.

The Illinois River is navigable for three-fourths of its length, and its lower portion accommodates most Mississippi boats. How much of the Illinois Basin has coal underlying it? (See Fig. 6.)

The Rock River Basin may be said to include all that part of the state lying north of the Illinois River Basin, except a small portion of the land in the extreme northwest, which drains directly into the Mississippi by several short, swift-running streams. This is the highest basin in the state. This little triangular corner of the state is peculiar in that the ice sheet did not cover it at any time, so the old surface appears just as it did before the glacial period, except that it has been weathered and worn down. The soil does not cover the surface deeply, and of course is not drift, but residual soil, being formed by the decay of the limestone bed rock. The rivers have worn deep cañon-like valleys through the rock with abrupt sides, unlike the river valleys in the glaciated portion of the state. The hills are not rolling, but have abrupt rugged slopes. A good supply of lead and some zinc are found in this little corner, though much less is being mined there now than formerly.

Between the Rock River and its main southern tributary, the Green River, the land is so free from slopes as to be poorly drained and much of it is occupied by swamps. This lower basin, as you would suspect, is well covered with flood plain soil or silt, making a rich farming land where it is drained, while the soil of the upper basin in a few places in the extreme southern portion is mainly clay deposited by the glacier. Except in a few places in the extreme southern portion, the bed rock in this basin does not contain any coal.

The Kaskaskia River Basin. — The Kaskaskia River rises in the central part of the southern slope of the Champaign moraine, but is kept from flowing into the Illinois River by a peninsula-like extension of the moraine. The Kaskaskia Basin is a long, narrow, triangular trough. On its northwest lies the Illinois Basin, and on its southwest, for nearly the whole distance, lies the Wabash Basin. The divide between the head of the Kaskaskia Basin and the Wabash Basin is formed by the Shelbyville moraine. The Kaskaskia River cuts through the western end of the Shelbyville moraine. The higher land, in the northern part of the basin, is drift clay deposited by the ice sheet. On account of its long north and south extent and these differences in soil, the north portion produces mainly corn and hay, while wheat and fruit grow well in the southern part. The Kaskaskia Basin lies almost wholly within the coal region, and a great deal of coal is mined.

The Big Muddy River Basin. — The Big Muddy River Basin is a short, triangular basin drained by the Big Muddy River and its two tributaries, the Little Muddy River and the Beaucoup Creek. These rise in the divide which separates the basin from the Kaskaskia Basin on the west and the Wabash on the east. The character of the basin is almost identical with the southern portion of the Kaskaskia Basin, low, flat land, with few elevations except the limestone rim along the Mississippi and the high, almost mountainous, divide on its south, which turns the river away from it into the Mississippi River. The southern part of this basin marks the southern extent of the ice sheet. In this basin the coal layers come very near the surface.

The Wabash River Basin. — The Wabash River Basin includes most of the state of Indiana and nearly all of the eastern part of Illinois. This part of Illinois forms the western slope of the Wabash River, and is drained by three large tributaries of the Wabash.

The soil drained by the upper portion of the Wabash River is thick glacial drift, except here and there where glacial lakes and swamps stood long enough to cause a covering of silt. In its lower basin, much of the land has the appearance of broad, flat, alluvial plains, composed of silt, with sand and gravel underneath. The more southern portion of this Wabash slope is drained by the Little Wabash River. It rises on the southern slope of the Shelbyville moraine and flows almost directly south, down the gradual slope to the lowlands, joining the Wabash just before it empties into the Ohio. The land drained by the Little Wabash River is low and resembles very closely the lower basins of the Kaskaskia and Big Muddy rivers. Coal is not found in any quantity on this slope of the Wabash, except in the lower part of the Little Wabash Basin.

The Southern Non-glaciated Region. — In going from that northern portion of the state which has been so affected by the ice sheet into this non-glaciated region, one notices at once a great change in the soil and surface structure of the land. The high hills are but thinly covered with yellowish residual soil. The limestone crops out everywhere in great, worn, broken ledges of rock. The small streams, unmolested by the glacier, have cut deep cañons in the rock. The surface of the bed rock where it is exposed is not smoothed off as in most of the state, but like that of the non-glaciated corner in the northwest, it has decayed into pieces and presents a rough, chipped surface. Because the ice sheet has not worn down the hills, they stand as abrupt peaks and not gradual rolling mounds as in the center of the state. This line of hills averages about 800 feet in height, rising abruptly from the lowlands on the north.

FIG. 18. — Characteristic view in the southern non-glaciated section of Illinois.

No large rivers drain this non-glaciated region, but many small inland swamps abound. The soil in the hilly portions is thin and unproductive, but into the more level lands a great deal of silt and sand has been washed and made many pockets of rich farm land. All along the Ohio River is a broad, flat flood plain with the richest kind of soil, extending back into the state for an average of fifteen miles, much like the flood plain which borders the Mississippi River most of the way along the western border of the state. This region is especially adapted to fruit raising.

III. CITIES AND COUNTIES BY PHYSIOGRAPHICAL REGIONS

The Chicago Plain. — The favorite route of the Indians and the early explorers and settlers, when they entered the Illinois country, was by way of Lake Michigan, up the Chicago River, and then over the narrow portage into the Des Plaines and Illinois rivers. Thus the Chicago plain formed the entrance to the shortest and most travelled route from the Great Lake Basin to the Mississippi Basin. The land was mostly low, and except where these patches of trees grew, it was flat prairie, covered with grass and prairie plants. Along the river banks and in the marshy places the wild onion grew in great abundance, on account of which the Indians named the river "Chi-Kang-Ong," meaning place of skunk weed or wild onion. Marquette wrote the name "Checangon," and from this has come the present name "Chicago."

In 1803 the government built Fort Dearborn on a high knoll on the south side of the river, just where its main branch bends to join the lake, at what is now the foot of Rush Street. Protection thus insured, families might settle in comparative safety.

In 1833 the Illinois-Michigan Canal was planned to be a great ship route from Lake Michigan to the Illinois River. It was necessary then to deepen the mouth of the Chicago River. This Congress did, and built a long pier on the north side of the entrance, thus straightening the river and making the present harbor entrance.

In 1837 Chicago was organized as a city of 4170 inhabitants. It had become a distributing point of great importance to the new West. Goods were sent from New York by the Erie Canal and the Great Lakes, and ships returned loaded with furs, grain, and lumber. The great need was of some more serviceable way of bringing the products from the interior into the city for shipment. Country turnpikes had been built in every direction, but they did not reach far enough, and the hauling was too difficult. This pressure was greatly relieved when the Illinois-Michigan Canal was opened in 1848. The first year's traffic through it was enormous for that day. Corn, wheat, fruit, and farm produce of every kind came from the center of the state and thence down the Chicago River. In this year the first car of wheat came into Chicago by rail, over the Galena and Union Railroad (now part of the Chicago and Northwestern).

After the first railroad had entered Chicago others came in rapidly, and in 1852 what is now the Lake Shore and Michigan Southern completed the first line of road connecting Chicago with the East. This opened up a new feature. All roads that would run into the northwest from the east must run south of the lake through Chicago. Thus Chicago was not only the center of north and south water traffic, but the natural center for all east and west land traffic.

Chicago of the Present. — From a town of 150 inhabitants and covering six square miles of territory, Chicago has grown in two thirds of a century to be the sixth city in the world, with 2,185,283 inhabitants (census of 1910) and covering 190½ square miles of closely occupied territory. The city occupies one fifth of Cook County.

Manufacture and Commerce Portion. — The location of Chicago, where it must of necessity have great advantages of transportation, has made it the great commercial heart of the nation. From all of the fertile country between the Rockies and the Appalachians, raw products are shipped to Chicago by rail and boat. These products then go through one or two processes: they are either stored in great collecting concerns of Chicago, resold, and shipped out in large quantities; or are here manufactured into new products and distributed over the world. Chicago has become the greatest collecting and distributing center of the United States for lumber, grain, and live stock, and the greatest manufacturing center for machinery, cars, furniture, and prepared meats.

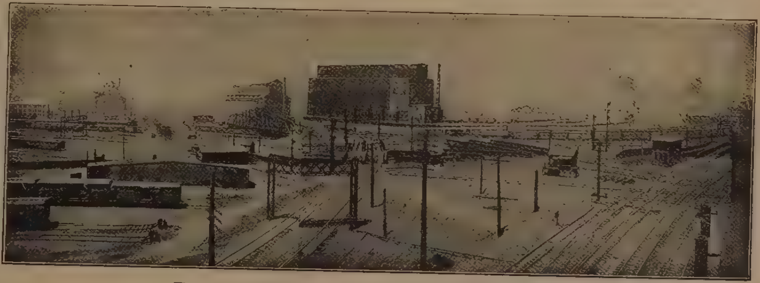
FIG. 19. — Grain elevators along the Chicago River.

As the railroads made their way into Chicago they aimed to connect with the commerce in the harbor and so built their main lines or branches to the river. Hence the river is the center of manufacturing, storage, and shipping, and presents a busy scene day and night. Great lake freighters, coal and lumber barges, many larger and smaller schooners, passenger steamers, and innumerable smaller craft continually fill the stream. The lower harbor of the Chicago River is lined with docks for the unloading of fruit, vegetables, flour, fish, and other produce for distributing through the city. Farther up the river from this busy portion are the huge elevators for the storage and transfer of grain on its way to the Eastern and foreign markets. Sixty-seven million bushels of grain can be stored in the Chicago elevators at one time. Great lumberyards cover many square miles along the north and south branches of the river. Most of this lumber comes to Chicago by boat from the north. It is received as rough timber and is manufactured into furniture and various forms of building lumber, doors, cases, moldings, etc., and is shipped out by rail.

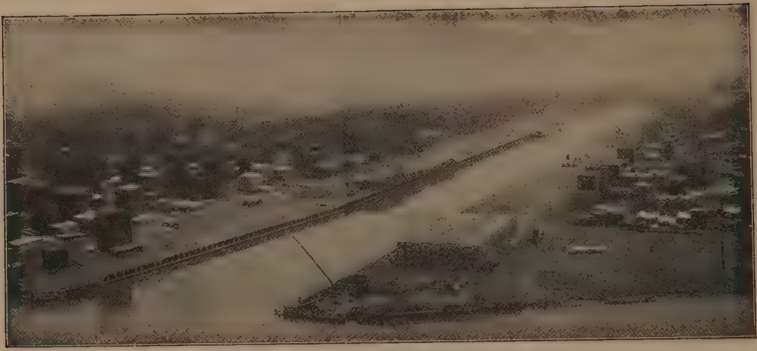

Fig. 20.—Lumberyards along the Chicago River.

Bordering the river nearly its whole distance, with river docks on one side and freight tracks on the other, are shops, foundries, mills, and manufactories of every description. Here various raw products are collected from as many different directions and manufactured into commercial products, ready for distribution into homes, farms, and other factories. The mammoth stockyard and packinghouse district is located near the south branch of the river, where it has every advantage of transportation facilities. Thousands of hogs, cattle, and sheep are shipped daily from the Western plains and the corn belt of the Mississippi Basin to the Chicago stockyards. In the great packinghouses the animals are slaughtered and the fresh meat is shipped in refrigerator cars to all parts of the United States. Most of the meat, however, is preserved by packing, smoking, drying, salting, and other processes, and a large amount of this is sent to foreign countries. A great number of manufacturing plants have grown up around the packinghouses. These make use of the by-products—hides, horns, bones, and refuse. All of the stock shipped to the stockyards is not slaughtered, but much of it is resold. The Chicago stockyards cover a square mile of land and are the largest and most important in the world. Each year the Chicago stockyards receive about nine million hogs, three million cattle, and three and one half million sheep.

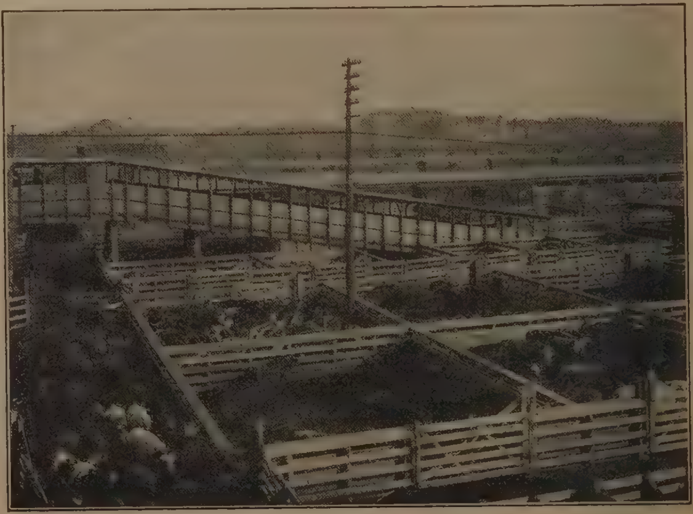

Fig. 21.—The stockyards, Chicago.

The branching river, with its long area for dockage extending into the heart of the city in every direction, is the central manufacturing district, smoky, noisy, and to the untrained it seems always unkempt and in a perfect hubbub of disorder, but to one who knows, it appears as well-organized progress putting forth every energy to meet the demands of the world. The region along the Calumet River is another busy district. Here are centered the iron and steel industries. The ore is brought in great barges from the mines of northern Michigan and Minnesota, and the vast quantities of coal which are necessary for refining and working it are brought by rail from the coal fields of Illinois or by boat from Pennsylvania. Around these large foundries have gathered many iron-working industries for the manufacturing of rails, car wheels, tools, nails, tacks, and all kinds of iron implements, until this has become the third center of importance in the United States for such manufacture.

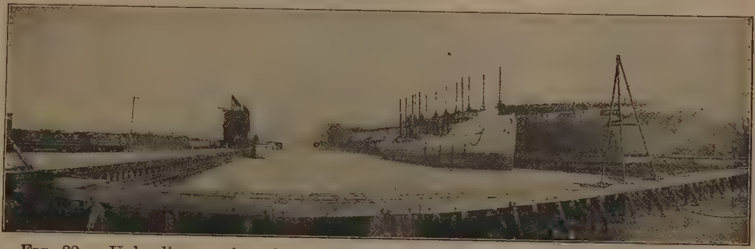
FIG. 22. — Unloading ore from lake vessels at North Slip of the Illinois Steel Company, South Chicago.

Manufacturing is not confined entirely to these river districts, but those industries which are not dependent upon the lake transportation have selected in many parts of the city regions accessible to railroads. As will be seen on the map, many roads enter Chicago by following the lake shore to the south of the city. These lead to many elevators, coalyards, and manufacturing concerns, chiefly out beyond the main residence portion of the city. At **Pullman** are the greatest car-manufacturing works in the world. Here the easily accessible wood and iron products are made over into cars of every description, from street cars to those palaces on wheels which serve as private cars for the European royalty.

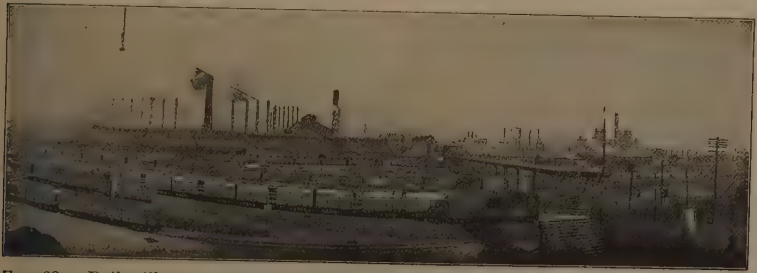
FIG. 23. — Rail mill, steel mill, blast furnaces, and railroad yard of Illinois Steel Company, South Chicago.

The Wholesale, Retail, and Office Portion. — The growth of the business portion early crowded the residences away from the river and occupied the three square miles lying south of the main branch of the river with great buildings which are filled with stores in the lower floors and offices in the upper stories. Many of the higher buildings extend from six to twenty-two stories above the street.

It is the natural tendency for business houses engaged in the same line of business to collect in the same district of the city, and the choice of location is usually dependent upon the convenience of transportation and sale facilities. For example, great quantities of fruit, vegetables, and fish come into the city by boat from the shore of Michigan, and formerly quantities of poultry and vegetables came down the river by small boats. The wholesale market for such things has naturally grown up along the river.

The Residence Portions surround the business portion on the three sides of the city — north, west, and south sides. These three residence districts are separated by the manufacturing districts which extend

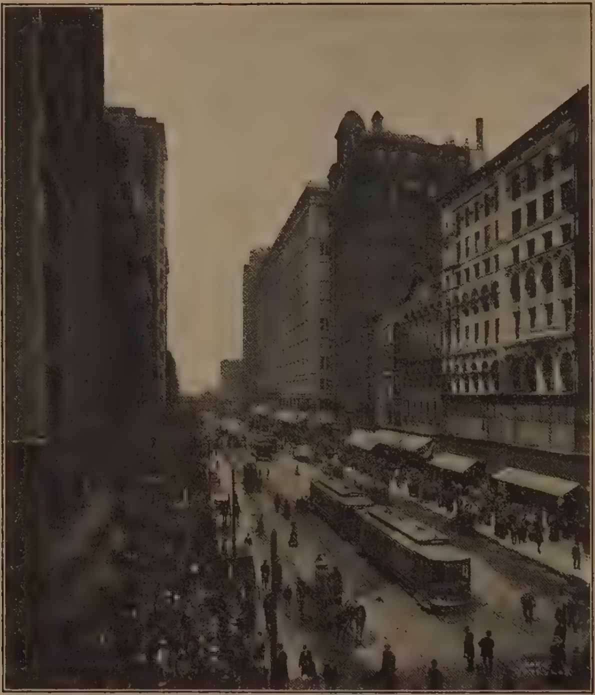

Fig. 24. — State Street, showing department stores.

along the river between them. All three are very similar in their organization and each is characterized by the distinctive districts peculiar to a large city.

The boulevards and parks form almost a continuous circuit of the city from the old World's Fair ground, now part of Jackson Park, on the south side, through Douglas and Garfield parks on the west side, and including Lincoln Park and the Lake Shore Drive on the north side. These form a most wonderful system of well-cultivated open spaces, and broad, well-paved and parked streets, making over 2000 acres of breathing space. The parks are fitted with outdoor gymnasia, natatoria, boating lagoons, botanical and zoölogical gardens, for places of amusement and instruction. Around this park system and stretching out beyond it are splendid residence districts. Here the residences are for the most part supplied with lawns, and the four to eight miles into the business portion are quickly traveled on the elevated roads and surface car lines.

The Suburbs. — Many of the business men of Chicago prefer to live outside the city limits, in towns where better accommodations for family comfort are possible. This desire has given life to many large and beautiful suburbs along the various lines of railroads running out of Chicago.

Educational institutions have kept pace with the rapid growth of Chicago, and the last few years have seen the development of one of the greatest universities in the world, the University of Chicago. Northwestern University at Evanston and Lake Forest University at Lake Forest are older institutions of the same class. Each of these has extensive professional schools of medicine, law, dentistry, etc., in the city. The Univer-

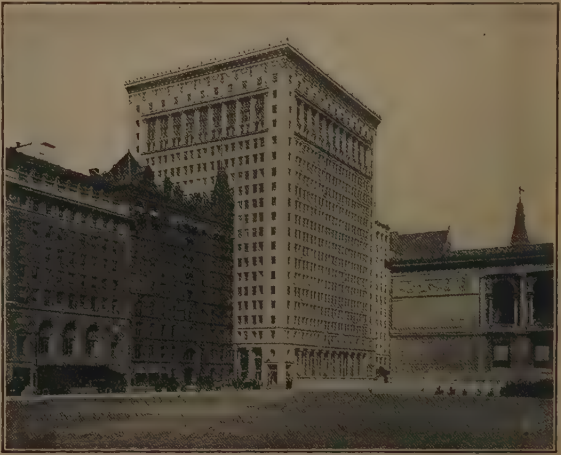

Fig. 25. — A skyscraper, People's Gas Light and Coke Company Building, Chicago.

sity of Illinois also has its medical school in Chicago. Many smaller but important schools and colleges of a private character are scattered through the city. The Art Institute on the lake front affords a splendid gallery and school of art. Private and public museums, the most important of which is the Field Columbian Museum, are assuming importance. Chicago's very complete public school system includes 234 schoolhouses for grade schools, 15 high and commercial schools, one home school for delinquents, and one normal school.

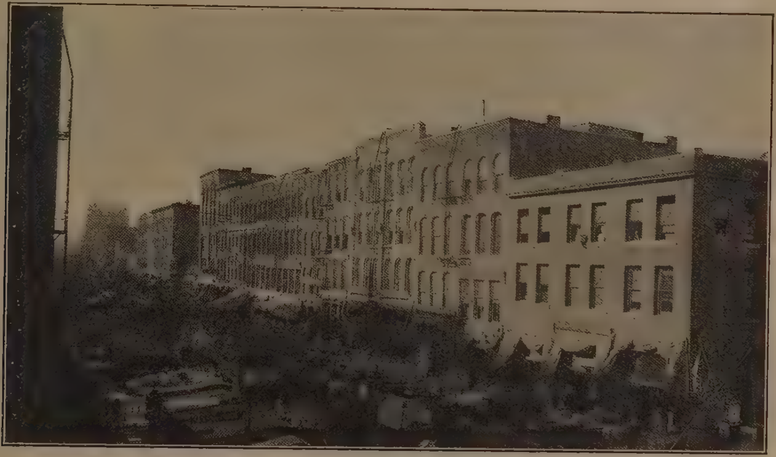

FIG. 26. — Wholesale fruit and vegetable market, South Water Street, Chicago.

Waukegan[1] (16,069) is the oldest and most important of the places located along the lake, north of Chicago. Waukegan is more favorably located than most of its neighboring towns, having a good harbor where lake craft can land. It is one of the important manufacturing cities of the state, its chief industries being steel and wire manufacture and sugar refining.

Joliet (34,670) is situated on the Des Plaines River, where the stream flows through a narrow channel and by a series of rapids naturally falls about 30 feet in five miles. The water power determined it as a manufacturing center, and the close proximity to coal has served to emphasize this feature of Joliet. The largest industries are the manufacture of steel and iron, wire rolling mill, blast furnaces, and machine

FIG. 27. — Blackstone Hotel, Chicago.

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[1] The numbers after the names of the cities indicate the populations according to the census of 1910.

FIG. 28. — A part of the mill district, Joliet, Ill.

shop products. A modern by-products coke oven establishment of great capacity is a recent addition to Joliet's industries. Joliet ranks as the fourth city in the state in value and importance of manufactures. These features have made it an attractive point for railroads. It is a junction point for four important roads. An electric line connects Joliet directly with Chicago. Many Chicago business men reside in Joliet. The great Illinois State Penitentiary is located here. Joliet is the county seat of Will County.

FIG. 29. — Waterworks, Aurora.

Kankakee (13,986) is the county seat of one of the youngest counties in the state. Kankakee is important in being the location of the Eastern Hospital for the Insane, the largest of the seven state insane asylums. The principal industries are the manufacture of tile and brick and the quarrying of limestone.

Morris (4563), the county seat of Grundy County, is one of the places whose growth was particularly stimulated by the Illinois-Michigan Canal. Its principal industries are still the shipping of farm produce, the manufacture of flour, brick, and tile, and the mining of coal.

Aurora (29,807) is situated with residence portions on the bluffs along both sides of the river, utilizing the lower level ground at the edge of the river for the business and manufacturing districts. One of the largest stove-manufacturing foundries in the world is located here. Aurora leads the state in car building, repairs, and railroad shop construction.

Elgin (25,976), 20 miles up the river from Aurora, is especially important as containing the largest watch factory in the world. It employs many highly skilled mechanics and workmen and produces watches equal to those produced anywhere. Clocks and watch cases are also manufac-

FIG. 30. — Elgin.

tured. Elgin is the most important dairy center of Illinois, manufacturing butter, condensed milk, and cheese. The Northern Hospital for the Insane is at Elgin.

St. Charles (4046) is also a dairy center of importance, and with its neighboring places supplies much of the milk consumed daily in Chicago. **Geneva** (2451) and **Batavia** (4436) are beautiful places situated on high bluffs along the river. The State Home for Juvenile Female Offenders is located at Geneva. **Ottawa** (9535) is the county seat of the large county of Lasalle, which ranks third in the state in number of residents and second in number of square miles.

Lasalle (11,537) is a more important manufacturing center than Ottawa, because of its better railway facilities. Three important railway lines pass through Lasalle, and here is the terminus of the Illinois-Michigan Canal. These facts have made the city chiefly a shipping and transfer point. In the early days this was the head of navigation. Coal and zinc are mined about Lasalle. One of the largest zinc works in the world is located here. The manufacture of cement is an important industry; implements, clocks, and glass are also manufactured.

Peru (7984) is closely connected with Lasalle, and produces clocks, scales, plows, and bricks. Quantities of ice are cut in these cities during the winter and shipped to places less fortunately situated. Lasalle and Peru are built on high bluffs overlooking the broad river valley, which at this point has cut into the bed rock in such a way as to leave many beautiful hills and cliffs.

Pontiac (6090) lies about 45 miles from the mouth of the Big Vermilion River. The water power of the rapids caused a mill to be built here, which for years was the milling center for all of the productive farm land around for many miles. Though this industry has become unimportant, it gave Pontiac with its three railroads the prestige which makes the town still the shipping and distributing center for this part of the state. The chief manufacturing industry is the production of boots and shoes. The Illinois State Reformatory is located here. Pontiac is the county seat of Livingstone County, which is the greatest oat-producing county in the state.

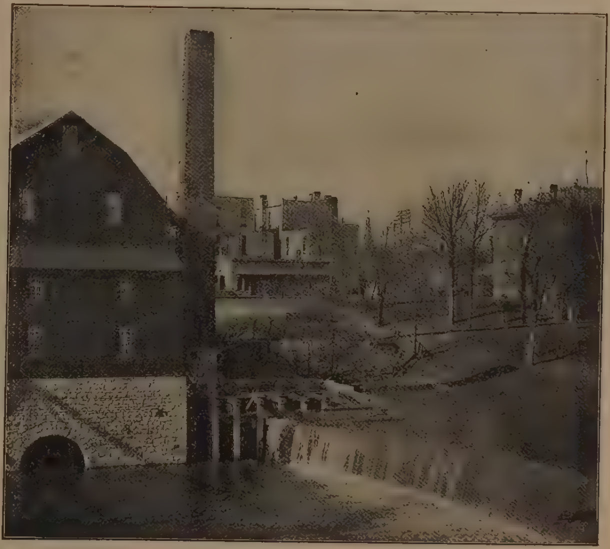


Fig. 31. — Mill at Pontiac on site of original mill.

Streator (14,253) is located about halfway between Pontiac and Lasalle. It is the heart of a great coal-mining region and is one of the most important coal-shipping centers of the state. Bottles, window glass, tile, brick, machinery, and hardware are the principal manufactured products. Corn and live stock are raised in abundance in the surrounding county and are shipped from Streator.

Hennepin (451) the county seat of Putnam County is important as being near the starting-point of the Hennepin or Illinois-Mississippi Canal. (See page 8).

The rich sloping land of Bureau County produces more fruit than any county in the Illinois Basin. The old town of **Princeton** (4131) is the county seat.

Peoria (66,950), the second city of Illinois, began as a French settlement, nestled on the level land under the high bluffs which stand back from the west side of the river and the lake. It was one of the last French towns to resist the settlement of Americans. Numerous railroad lines from all directions bring raw products for manufacture and distribution in this busy city. Its central location has made it a great wholesale center for groceries and provisions, and a great receiving point for corn. The country all about is underlaid with coal, and mining has made Peoria an important place for the manufacture of machinery and implements. The cheap fuel has led to the manufacture in Peoria of nearly 4 per cent of the total manufacture of the state. Being in the heart of the great corn belt, it has grown to be the most important center in the United States for the manufacture of glucose, alcohol, and distilled liquors.

FIG. 32.—Bradley Polytechnic Institute, Peoria.

Galesburg (22,089) is the county seat of Knox County, which lies on the highland of the Champaign moraine, forming the divide between the Illinois and Rock River basins. The location here of Knox College and Lombard University makes it something of an educational center, with the characteristics of a college town. A superior quality of paving brick is manufactured here.

Monmouth (9128) is almost directly west of Galesburg, and is the county seat of Warren County. This is one of the few wheat-producing counties of northern Illinois, but its wheat harvest does not equal in value the production of corn or of live stock. Monmouth is much like Galesburg in its characteristics, and is the seat of Monmouth College. Pottery, plows, tile, and brick are its most important manufactures.

Pekin (9897) is situated a few miles below Peoria on the flood plain of the east bank of the Illinois River. It is the county seat of Tazewell County and the center of a great coal-mining region, shipping great quantities of coal over the four roads centering there. It is an extensive manufacturing place, producing farm implements, flour, hominy, and other corn products. Like Peoria, it produces distilled liquors, glucose, and starch.

Havana (3525) is the county seat of Mason County, and is situated in the broad portion of the Illinois River valley where the flood plain spreads out into a great level floor covered with rich, sandy loam and silt soil. This flood plain continues for many miles on the east side of the river through the western part of Cass, Morgan, Scott, and Green counties. The conditions of soil here make this strip a splendid wheat-producing region, while the protection offered in the lower valley by the bordering bluffs makes the region also suitable for the production of fruit.

Beardstown (6107) is situated much as Havana is. Both are extensive shipping points for wheat, live stock, fruit, ice, and fish. The Illinois River is one of the greatest fish-producing streams in the United States. Nearly half a million dollars' worth of fish are taken out annually, and many persons make good profit by fishing along the river in this region.

Jacksonville (15,326), the county seat of Morgan County, is located on the highland, back from the Illinois River. Railroads were afterward built along these roads, making Jacksonville an important junction and shipping point. Although it has some extensive manufacturing and shipping interests, it is chiefly an educational center. The State Institution for the Education of the Blind and Deaf and the Central Hospital for the insane are located here. The other educational institutions are Illinois College and Illinois Woman's College.

In 1831 **Bloomington** (25,768) was made the county seat of McLean County. In 1852 this prosperous farming community attracted the Illinois Central Road, which built along the old north and south road. The "Big Four" soon took advantage of the old Danville road, and Bloomington became a shipping and transfer center.

Normal (4024) was originally a railroad junction of North Bloomington, but in 1857 the state legislature provided for the first state normal school west of New York, and established it in North Bloomington as the State Normal University. Around this grew up the town of Normal, one of the educational centers of the state.

Lincoln (10,892) is a railroad and distributing center for the region and the county seat. Its coal, agricultural products, and lumber from the numerous stream valleys furnish Lincoln with many commodities for exchange.

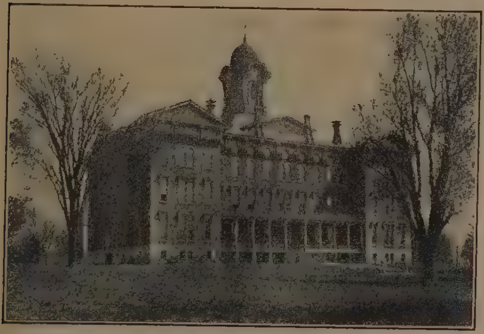


FIG. 33.—Main building, State Normal University, Bloomington.

Springfield (51,678) has become important, not only as a political and railroad center, but as a manufacturing center.

The real importance of Springfield comes from its political position as capital of the state. The capitol building is one of the finest state capitols in the West. In it are all of the offices of the several state departments. The library and museums are especially fine for state institutions. The state Senate and the House of Representatives meet here every two years. During this legislative season Springfield is a busy place. Besides the 204 legislators, many clerks, copyists, and other interested people fill the city with an excitable, anxious throng. Curiosity makes Springfield a place of interest to tourists at such times. For, besides the Assembly, there are places of historic interest in the old home of our martyred President, Abraham Lincoln. The Lincoln Monument marks his burial-place, and his former residence is controlled by the state and kept in much the same condition in which he left it.

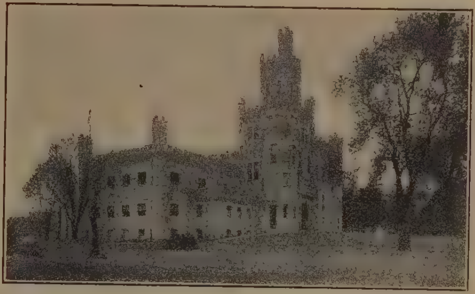


FIG. 34.—The gymnasium, Illinois State Normal University, Bloomington.

Alton (17,528), an older settlement than Springfield, is chiefly a manufacturing city. The large glass factories, the shoe factory, implement works, and flour mills are built on the level plain along the river, while the residences are built back on the edge of the bluffs and in the wooded ravines that run in among them. Alton's chief industry is the manufacture of glass commodities,—bottles, etc.,—at which 3500 men are employed. In what county is Alton? What is the county seat?

East St. Louis (58,547).—St. Louis in Missouri easily became and is at present the great distributing point for southern

Illinois. One great disadvantage it has always felt, however, is its situation on the west side of the Mississippi, all goods crossing the river having to pay a high bridge toll. So, naturally, East St. Louis became a manufacturing and shipping addition to St. Louis. The land was drained, dikes were built along the river to keep the floods back, and as a consequence homes and retail stores were built until East St. Louis became a low, muddy city of about 15,000 inhabitants. A general move was made to elevate the whole city, and one of the most wonderful undertakings in city building was accomplished. The level of the whole city was raised from eight to twenty feet. The work is hardly finished, but residences have been built and more manufacturing concerns have moved in, so that East St. Louis has nearly doubled in size in the last ten years. In 1910 it was the third city in size in the state, and the third in importance of manufactures. The industry of most importance is the exchange and slaughter of live stock. The great stockyards cover 650 acres and are next in importance to those of Chicago. Here is the largest horse and mule market in the central West. All of the large meat-packing firms have big plants here. The several large iron-working and foundry concerns make use of the iron ore shipped up the river from Missouri. The lead mines of Missouri supply East St. Louis with lead ore, from which is manufactured white lead paint. Flour, glass, and beer are important manufactured articles. Nineteen railroads center here, making an important freight exchange and grain storage center. In what state is St. Louis? In what county is East St. Louis?

Fig. 35. — Factory for manufacture of fruit crates, typical of southern Illinois.

The Kaskaskia River Basin

From the high bluffs east of East St. Louis the surface slopes gradually to the Kaskaskia River and is underlaid by thick veins of coal. The Illinois counties surrounding St. Clair County include the greatest wheat, rye, and barley producing region of the state. Fruit is also grown in some abundance. In going through this basin one's attention is attracted by the large, thrifty-looking farms. They seem older than those in the north, and nearly every farm has its old orchard. Many young fruit trees have been set out in this section, and large fruit farms are beginning to produce an abundance of apples, peaches, and small fruits for shipping north. There is a noticeable absence of large cities in this basin, although it was the first generally settled part of the state. Many small cities, towns, and villages form centers to which the farmers bring their crops, grain, and fruit, and where they buy their supplies of clothing and tools. The cities were either located as the remains of some old French or English settlement of the early days, or have sprung up along the railroads at junctions or shipping points.

Belleville (21,122) is the largest city of the lower basin. It is located on the highland near the center of St. Clair County, of which it is the seat. It is a thrifty city with a large German population, chiefly engaged in the mining of coal and manufacture of iron.

Vandalia (2974), many years ago the state capital, is now, like Nashville (2135), Carlyle (1982), Greenville (3178), Salem (2669), and Hillsboro (3424), a prosperous little railroad center for the collection of agricultural products and coal, and chiefly important as a county seat. (Of what counties are these places the seats?) Centralia (9680) is a rapidly growing city, located chiefly on account of the rich beds of coal mined in that locality. It has become noted as a shipping point for fruit, especially apples, berries, and melons. The land about the head waters of the Kaskaskia is the high, well-drained rolling soil of the Champaign and Shelbyville moraines, with wooded ravines and fresh-water springs, which appeared so attractive to the early settlers. This region was quite thickly settled and divided into large counties before any cities grew. When Shelby County was organized and the commissioners looked for a suitable seat, they chose a high mound near the west bank of the river where a spring attracted their attention. Here Shelbyville (3590) grew in a railroad center for a rich corn country. The upper Kaskaskia Basin is part of the great broom-corn producing region, and the manufacture of brooms is a consequent industry of Shelbyville. Coal is also mined in large quantities. Pana (6055), 20 miles west of Shelbyville, in Christian County, is a railroad and manufacturing center. The extensive mining of coal has led to the manufacturing of iron commodities. A great deal of live stock is shipped from this region, mainly to East St. Louis.

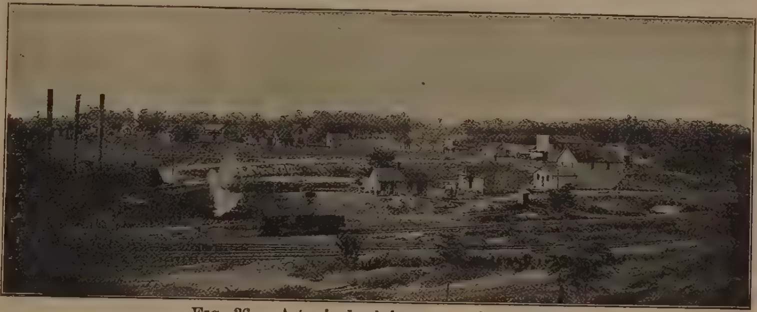


FIG. 36. — A typical mining town of Illinois.

FIG. 37. — Typical young orchard of Big Muddy Basin.

The Big Muddy River Basin, together with all the low land of southern Illinois, is familiarly known as "Egypt," a term which seems well applied when one realizes the extent of flood plain soil. The northern part of the basin, like the northern part of the state, is covered with glacial drift; but its lower, southern part remains uninfluenced by the ice sheet and is covered with fine loam soil, which was deposited largely by old glacial lakes and drainage streams from the higher land on the north and south. The southern climate and abundant rainfall make this basin, together with a like region in the Saline River Basin directly east, the great fruit belt of the state. On the southern slopes of hills and rolling prairie all kinds of trees and small fruit flourish. The resources of this region are not as yet fully developed. Only within the last few years have the possibilities of this rich land been understood. Much of the country is covered with good forests of white and red oak, hickory, elm, and gum. The absence of glacial drift has left the bed rock close to the surface, and in many places thick veins of the best coal in the state crop out from the northern slope and are easily mined by slope mines and shallow shafts. Until recently the transportation facilities of the region have been very meager. With the building of railroads and a chance to ship out the products of the region comes the prospect of energetic residents and abundant capital which will make southern Illinois one of the greatest fruit regions of the United States.

Mount Vernon (8007) is located on a high mound where two old wagon roads have a junction, crossing near the head of the Big Muddy River. It is now a railroad center and county seat. Surrounded by good farms on which quantities of fruit, hay, and wheat are raised, and underlaid with good coal veins, it has become a shipping and manufacturing city. The Mt. Vernon Car Manufacturing Company has a large establishment here. Quantities of white oak from the forest of this basin are cut into railroad ties. At Mt. Vernon a large plant treats these ties with chemical substances to

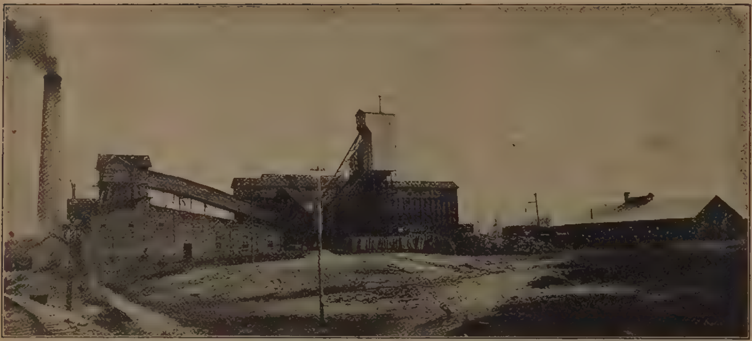


FIG. 38.—Mine buildings. Shaft, washer, and implement house of Peabody Mine, Marion.

preserve them from decay. Murphysboro (7475), Carbondale (5411), and Marion (7093) are the largest centers of importance in the lower basin, and are typical of all the smaller places of Franklin, Williamson, and Jackson counties. The city population is mainly concerned with the mining of coal. Sawmills and factories for the manufacture of fruit crates, tool handles, and parts of farm implements are scattered throughout the region. Each city, town, and village has one or more elevators for the shipment of wheat, which produces well here. Corn is little grown. At Carbondale is the Southern Illinois Normal University, the largest educational institution in southern Illinois. What counties are included in the Big Muddy Basin?

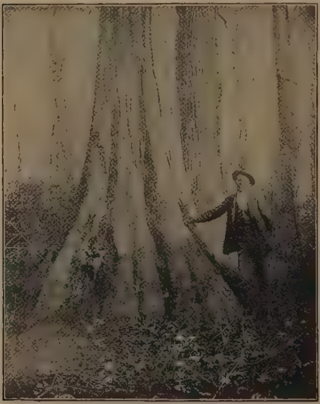


FIG. 39.—Cypress trees in swamp of southern Illinois.

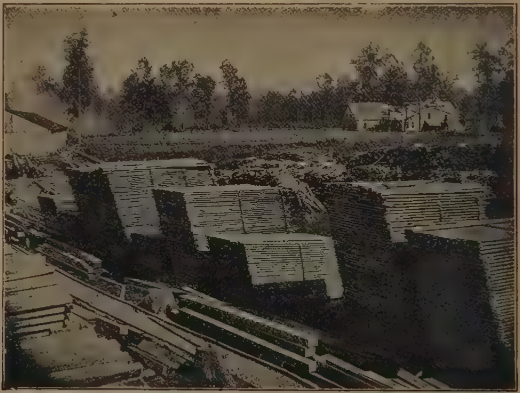


FIG. 40.—Lumberyard near implement and crate factories in southern Illinois non-glaciated region.

The Southern Non-glaciated Region.—Going south from the Big Muddy Basin, the land rises abruptly and the whole appearance of the country changes. The great rocky hills of the Ozarks rise to 700 and 800 feet, away across the state in Union, Johnson, Pope, and Hardin counties, except where the Mississippi and Ohio rivers have worn their valleys and built their flood plains on the west and east. These hills are not productive of agricultural crops or coal. Where their limestone cliffs have given way to narrow valleys or broad slopes, large oak, elm, and hickory trees make forests capable of producing good lumber. From the hills the land slopes to the Ohio and Mississippi rivers in broad, shelf-like terraces. The lower terraces are swampy and filled with rough forests of cypress and softwood trees. This land needs drainage and clearing before its rich soil and warm climate can be properly utilized. Where the land is higher and well drained it is a wonderful fruit and wheat producing region.

Cairo (14,458), the most southern point of Illinois, is located on a tongue of land which is below high-water mark, and has been built on a bar of sediment at the entrance of the Ohio into the Mississippi River. Great levees have been built about the city 55 feet above low-water mark, and a pumping system rapidly empties the city of any seepage water that enters. The business portion and much of the residence portion have been filled up to a higher level. A great railroad bridge costing four millions of dollars has been built across to the Kentucky shore. Cairo has become a great point of exchange between the grain-producing section of the North and the grain-consuming region South. Down the Ohio and its extensive tributaries and down the northern Mississippi and its tributaries many ships bring cargoes, to be distributed by rail or reshipped in larger boats down the Mississippi. Most Gulf of Mexico boats can ascend the Mississippi to Cairo with cargoes for distribution to the north. The lumber industry is of the greatest importance.

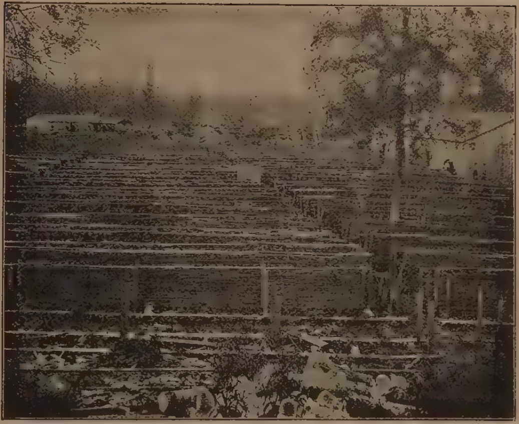


Fig. 41. — Piece yard, showing pieces ready for manufacture into fruit crates.

Mound City (2837), Metropolis (4655), Golconda (1088), Elizabethtown (633), and Shawneetown (1863) are small county seats that have grown upon the higher mounds along the Ohio. They are all alike interested in the river traffic. The chief industry of each is woodworking in small mills and factories. The hardwood lumber which comes down the Ohio is here made into parts for farm implements and sent to the manufacturing centers in the northern part of the state. Of what county is each the county seat?

Fig. 42. — The Johnson fountain in White Park, Champaign.

Fig. 43. — College of Agriculture, University of Illinois, Urbana.

The Wabash River Basin in Illinois. — The land of Champaign and Vermilion counties, drained by the Vermilion River, is much like that of the Champaign moraine as described about Bloomington. The broad, rolling fields produce large crops of corn and hay, and consequently live stock is fattened and shipped either to Chicago or St. Louis. Coal is mined in some quantities in the eastern part, especially about **Danville** (27,871), the county seat of Vermilion County. As in the days of its infancy Danville has continued as a junction place. The old roads are now occupied by railroads running east and west and north and south. The shipments of coal, corn, and live stock are large. Brick, tile, flour, and carriages are manufactured. **Champaign** (12,421) and **Urbana** (8245) are located so near together that they almost form one city.

The location of the State University at Urbana, in 1867, has made these places chiefly educational centers. The railroads have made Champaign the railroad center, though the Big Four Railroad shops at Urbana give rise to the largest single industry. Which is the county seat?

Paris (7664) is located on the Shelbyville moraine, where the old Mt. Carmel road branched off to the west. Its chief manufactured articles are brooms made from the broom corn grown throughout this part of the state. Corn, live stock, and fine horses are shipped. Paris is the seat of Edgar County. **Mattoon** (11,456) is a railroad center on the Shelbyville moraine. The large railroad shops account for much of its population. Brooms, farm implements, and agricultural products are its chief productions. **Charleston** (5884) is the county seat of Coles County. The region along the Wabash and its tributaries, the Embarras and Little Wabash rivers, is much like that of its neighbors, the Kaskaskia and Big Muddy rivers on the west. The agriculture of all this region along the Embarras River is mainly taken up with the production of broom corn. These counties produce two thirds of the broom corn grown in the United States. Corn and live stock are raised in less abundance than they are farther north, wheat and fruit becoming important in their stead. The cities are smaller, and of importance mainly as railroad centers and county seats. Coal is mined extensively in the lower basin of the Little Wabash and Saline rivers and makes manufacture of some importance. **Olney** (5011), **Mount Carmel** (6934), and **Carmi** (2833), are the largest cities of this section.

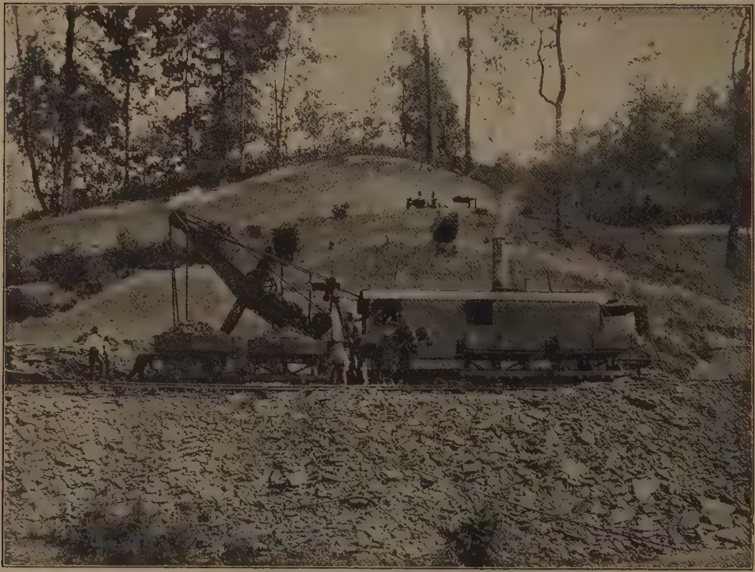


Fig. 44. — Building a railroad through a typical southern Illinois region. Limestone with thin soil above.

The Rock River Basin is the highest basin in the state. The river, with its two important branches, the Pecatonica and the Kishwaukee rivers, falls rapidly but gradually from the highlands to its mouth, thus furnishing excellent water power for manufacturing purposes. The rolling land above the valley is well occupied with farms, where corn and hay, and consequent live stock, are produced in abundance. The dairying industry before noticed along the Fox River is prominent also in the Rock River Basin. More rye is produced in this basin than in any other in the state. No coal is mined in the basin. The northwestern corner of the state can hardly be included in this basin, but drains by short streams directly into the Mississippi. This is a non-glaciated portion, and its characteristics are marked. (See page 9.) The early discovery of lead and zinc ore along Fever River caused a great rush for this region, and **Galena** (4835) grew as a mining center. These metals are still mined in small quantities, but the discovery of other richer deposits farther west and the tendency to exhaust the supply here have decreased the importance of the industry in Illinois. Galena was for a long time the home of U. S. Grant. His house is still preserved in memory of him. Of what county is Galena the seat? The early emigration to Galena had an important effect upon the development of the Rock River Basin. Where the old roads led across the river, settlements started and have grown into cities, chiefly important as manufacturing centers. This region was settled almost entirely by people from the North, New England, and New York State. The wooded valleys and well-drained land had their influence on making the handsome cities now found in this basin.

Freeport (17,567) grew from a small settlement started in a high and attractive location. It is now an important railroad center and manufacturing city. Windmills, vehicles, and implements are the chief manufactured articles. Of what county is Freeport the seat?

Rockford (45,401) began as a settlement where the same Galena road which passed through Freeport forded the Rock River. The broad, level flood plains on each side of the river, bordered with high bluffs, formed an attractive birthplace for what was to become one of the most beautiful cities in Illinois. The first settlers were New Englanders, and their energy, attracting more people of the same kind, built the present manufacturing and shipping city of Rockford. Working lumber into furniture, doors, sashes, and windows, and manufacture of hosiery, knit goods, and agricultural implements are the chief industries. Dairy products and harness supplies are important shipments. Rockford is a large wholesale center for northern Illinois and southern Wisconsin. It is also an educational center. Rockford College is situated here. Of what county is Rockford the seat?

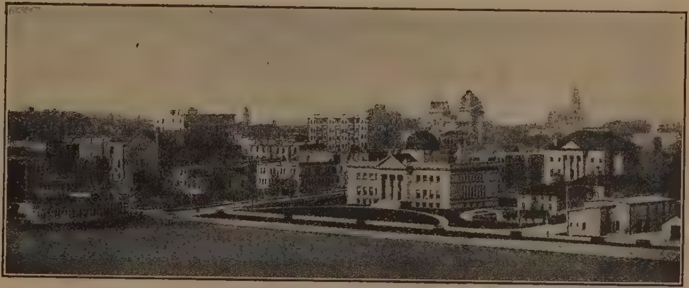


Fig. 45.—Water front, showing business district, Rockford.

Belvidere (7253), like Freeport and Rockport, owes its location to the old road crossing over the Kishwaukee River. The country surrounding Belvidere is especially suited for dairying, and Belvidere is noted for the manufacture of condensed milk and other dairy products. The largest sewing machine factory in the state employs 1500 skilled workmen, and is located at Belvidere. This town is the seat of Boone County. Dekalb County is also in the stock and dairy region. The land is high and is drained by a number of streams, north into the Rock River system and south into the Illinois River. The natural timber along these streams attracted the early settlers, who believed that crops could not be grown on the prairie soil. In the contest for the county seat **Sycamore** (3926) was selected and soon became the commercial center for the region. The canning of vegetables and manufacture of hardware are the important industries. **Dekalb** (8102) has outgrown the county seat, chiefly owing to superior railroad facilities, and has become an important manufacturing and shipping center. Barb and woven wire fencing is the most important manufactured product. Large dairy and fancy stock farms surround this city. Dekalb is the seat of the Northern Illinois State Normal School.

Dixon (7216) is one of the oldest cities in this basin. Dixon's Ferry, across the Rock River at this point, was a popular crossing place for the more southern of the old roads leading to Galena. The water power has made Dixon a manufacturing city. It has the largest condensed-milk factory in the world. Wagons, farm machinery, and pianos are manufactured. Of what county is Dixon the seat?

Sterling (7467) and **Rock Falls** (2657), on either side of the river, are a few miles from Dixon, and both are manufacturing centers, located where rapids in the river give natural water power. The manufacturing of harvesting machinery and farm tools is the most important industry. What is the seat of Whiteside County?

At the mouth of the Rock River the Mississippi divides and flows on both sides of a large limestone island. On the east bank are low flood plains; on the west, high bluffs. The east bank was the more favored for residence, and a small settlement grew rapidly on the broad flood plains, under the protection of the prominent bluffs behind. When Rock Island County was apportioned off, this settlement became the seat under the name of Rock Island. At this point the Mississippi River flows over rapids with a fall of 21 feet in 14 miles. These rapids are especially prominent on the east side of the island, and in a very early day this splendid water power was utilized for small mills to make lumber of the logs that were floated down the Mississippi from the more northern forests. Then Rock Island, and the city of Davenport in Iowa on the west bank, became great lumber centers for a time, but the decreasing supply of lumber in the northern forests has caused this industry greatly to diminish. Numerous manufacturing concerns built along the river to use the water power. The growth along the river was limited by the high hills above the flood plains, and another manufacturing city, Moline, grew just above Rock Island. Thus the tri-cities of **Rock Island** (24,335), **Moline** (24,199), and Davenport grew on the shores about the island. The island made the river easy to bridge at this point, and the government aided the Chicago, Rock Island, and Pacific Railway to build here the first railroad bridge across the Mississippi connecting the West with the East. This gave the tri-cities the impetus to boom into what they now are, — centers of manufacture and shipping. The island is the property of the federal government, and on it is the most complete government arsenal for the manufacture of army supplies. Between 25,000 and 30,000 men are thus employed who make their homes in the tri-cities. Rock Island is the chief railroad center. Its manufactures are mainly lumber, stoves, plows and farm implements. Moline has a population largely composed of thrifty Scandinavians. This with its water power has made it a manufacturing city. The largest plow works in the world are located here. Many other farm implements, wagons, brick, tile, lime, etc., are manufactured here. The tri-cities have always felt the lack of any connection by water transportation with the Great Lakes. For many years it has been planned that a canal should be built through the old Mississippi River bed (see page 8), from below the rapids on Rock River to connect with the Illinois near Hennepin. This canal is now completed, connecting with the tri-cities by a cheap canal route Chicago and the Great Lakes by means of the Illinois River and the Illinois-Michigan Canal.

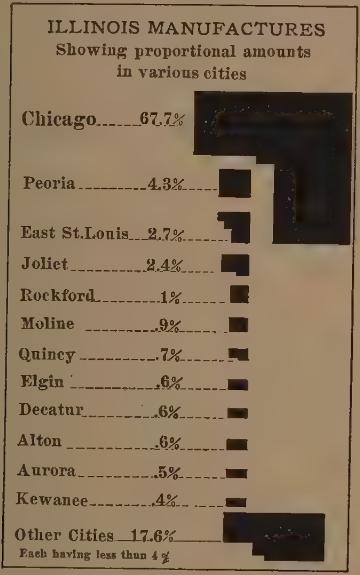
The Mississippi River below Rock Island, to the entrance of the Illinois River, flows between high bluffs on each side; but on the Illinois side for most of the distance a low flood plain lies between the river and the bluffs, so low that it is poorly drained and subject to overflow and floods from the Mississippi. At a few places the bluffs come near the river, and here small towns have grown.

The only place of great importance is **Quincy** (36,587), located where the long line of bluffs makes a bend toward the river, leaving high land and a splendid location for a city. The Indians realized the advantages and beauty of this location, and one of the largest Sauk villages was located here. A white trading post was located here, and its growth progressed.

Quincy formed a good landing place for early river transportation, and from it old trails ran in all directions to the center of the state. On account of the high bluffs on each side the river was easily bridged, and Quincy became the distributing point, not only for Illinois, but for northern Missouri. It is also an important railroad and manufacturing center and ranks third in size in the state. Its chief industries are those concerned with the manufacture of lumber into commodities: furniture, cabinets, implements, and wagons.

SUMMARY

Population. — Illinois ranks as the third state in the number of its inhabitants, only New York and Pennsylvania having a greater population. "The population of the state in 1910 was 5,638,591, as compared with the population in 1900 of 4,821,550, showing an increase during the last ten years of 817,041, or 16 per cent. The total land surface of Illinois is 56,650 square miles, of which 650 square miles is water, the average number of persons to the square mile being 99. There are 930 incorporated cities, towns, and villages in Illinois: 614 have less than 1000 inhabitants; 878 have less than 5000; 27 have more than 5000 but less than 10,000; 14 have more than 10,000 but less than 20,000; four have more than 20,000 but less than 25,000."[1] All of the larger cities of Illinois show an increase in population since 1890. The largest percentage of gain is 97.4 for East St. Louis and the smallest 0.9 for Quincy.



The urban population is rapidly increasing in the northern part of the state, and the country population in the southern portion of the state is growing as the value of the land for agricultural purposes is being realized. The population is much denser in the western and northern parts of the state and also much denser along natural transportation routes than it is in counties situated at a distance from lakes or navigable rivers.

Agricultural and Mining Products. — As an agricultural state Illinois ranks among the first, the value of its farm lands being the highest of any state; it falls below Iowa alone in total value of farm products. Corn is the greatest crop, and as a corn-producing state it ranks first, surpassing Iowa slightly in amount and value of its corn crop. The principal corn-producing part of the state is the central and northern portion, the Illinois and upper Kaskaskia and Wabash basins. The small amount of wheat produced in Illinois is not nearly enough for its own consumption. Rye is grown principally in the northwestern part of the state. Most of the crops raised in Illinois are turned into stock or dairy products; 450,000,000 gallons of milk are annually produced in the state. Illinois stands as the fourth state in the production of hogs and fourth in the number and value of its cattle. It takes the first place as a producer of horses and mules. The dairy products, milk, butter, and cheese, so extensively produced in the northern part of the state, cause Illinois to rank fourth in this line. As a fruit state its influence is just beginning to be felt through its railroads newly built into the southern portion, thus giving a means of rapid transportation to the market.

Apples are grown over the greater part of southern Illinois, the counties of Clay, Marion, Richland, Wayne, Jefferson, Hamilton, Crawford, Effingham, Fayette, respectively, being the heaviest producers.

Peaches are grown to a greater or less extent over all of southern Illinois. Commercial orchards, however, are confined mostly to territory on the Illinois Central and Chicago and Eastern Illinois lines, which give quick transportation to northern markets. Marion and Union counties lead in this line. Jackson, Johnson, Pulaski, and Alexander counties are important producers of small fruits.

Gem melons are produced in great quantities. Marion County produces annually from 500 to 700 carloads. Madison County stands second; 800 cars of fruit and vegetables are loaded at some stations along these lines, and as high as 400 cars of apples alone were loaded at some points in Clay County in 1892.

The fifty-one million tons of coal mined in the state in 1910 have given Illinois the place next to Pennsylvania and West Virginia as a great coal-producing state.

In 1910 the Illinois oil fields, of which Robinson and Centralia are important centers, produced as much petroleum as the Pennsylvania, Ohio, and Indiana fields combined. The Fluorspar mines of Pope and Hardin Counties are among the most important in the world.

Transportation and Manufactured Products. — Illinois ranks third as a manufacturing state. "The high rank of Illinois as a manufacturing state is due primarily to its transportation facilities. The communication with the East afforded by Lake Michigan and its connecting waters early made Chicago the great distributing center for Eastern products to all points in the West and Southwest, while the Mississippi River, bordering the west portion of the state, afforded communication with the entire Mississippi Valley. Superior railroad facilities were the direct result of the trade routes established by these opportunities for water transportation; for, when railroad building began, Chicago was the natural focusing point, and to reach that city all sections of the state were traversed and opened up to settlement. In 1909 there were 11,850 miles of railroad in Illinois, a larger mileage than was shown for any other state in the United States except Texas. With such facilities for obtaining raw material and for marketing manufactured products, and with abundant bituminous coal in many sections of the state, the development of manufacturing has naturally been very rapid." In no other state are small cities and towns so noted as manufacturing centers.

Slaughtering and meat packing is the most important industry in Illinois. In the 68 establishments reported in 1905, employment was given to 26,957 wage earners, and the produce was valued at $317,206,082. Chicago is the great live stock market for the West and Northwest. The packing of meats was begun there in 1836 before the city was incorporated. The manufacture of iron and steel ranks second among the industries of the state, with 27 establishments and products valued at $87,352,761. This industry owes its great development in Illinois to the iron mines of the Lake Superior region, the cheapness and ease with which the ore is handled on the docks of Chicago, and to the low price at which the large supplies of bituminous coal are placed on the market. The first important iron plant in the state was the rolling mill built on the north branch of the Chicago River in 1857. The first steel rail made in the United States was rolled in this plant. The manufacture of foundry and machine shop products ranked third in Illinois in 1905 with 793 establishments and products valued at $79,961,482. There were 779 establishments making clothing in 1905 and the value of their product was $67,439,617. In 1905 there were 127 establishments manufacturing liquors; the total value of malt and distilled liquors made was $77,888,841. The abundance of corn caused distilleries to be started in many parts of the state at an early date, but Peoria seems to have been the most favored location for this industry. This city has become the largest producer of whiskey and high wines in the United States. The products of the 363 flour and gristmill establishments were valued at $39,892,127. This makes this industry sixth in importance in 1905. Following it very closely is agricultural implements with 82 establishments and products valued at $38,412,452. The agricultural expansion of the state was so rapid that the blacksmith shops early developed into agricultural implement factories. The two important raw materials were obtained at low prices as a result of the cheap transportation afforded by the Great Lakes. This condition gave the rapidly growing state a great advantage, and many Eastern manufacturers of these products located their plants in the new field. Men in other pursuits changed their occupations and embarked in manufacturing enterprises of this character. Competition aroused the inventive spirit, and one improvement after another followed. Plows, wagons, and all kinds of machines demanded or needed by the farmer are now made in Illinois. Illinois ranks first in the manufacture of agricultural implements.

Other important manufacturing industries in their importance are 16 large establishments engaged in making steam railroad cars. These produced rolling stock to the value of $30,926,464, giving Illinois first rank in this line of manufacture. In addition there are 99 railroad establishments engaged in the manufacture of steam railroad cars and general shopwork to the value of $25,491,209. Ninth in the list of Illinois manufacturing industries is the printing and publishing of newspapers and periodicals, and tenth is book and job printing. Bread and other bakery products have an important place among the state's industries. The value of the products of the 1406 establishments was $26,145,472. The furniture industry is represented by 202 establishments. The value of the lumber and planing mill products was $18,296,035. This industry was represented by 270 establishments. Electrical machinery, apparatus, and supplies to the value of $16,700,027 were produced by 104 establishments. These are the 14 most important industries of the state.[1]

Government. — There are certain things which must be done in order that the 5,638,591 people in the state may advance and live peaceably and conveniently together; laws must be made to keep them from interfering with one another, roads must be built, schools held, and homes protected from fire and thievery. If every man took the time to do all these things for his family, he would have little time for other business. It has been found best that each man should attend to his special business and contribute part of his earnings to pay men who are capable of doing these things for the good of the people of the state. It is intended that each man should have an equal chance at election time in voting for the man whom he wishes to have do these things for him. The state is divided into various districts, each with its definite boundaries and each with a special part to play in the organization of the whole. Each school district, township, county, and legislative district has its own officers elected by the people residing within its boundaries, and over all is one executive, Governor, elected by the people of the whole state.

All the states which are united to form the United States are very similar in their organization within themselves. Each state has control of matters within its own boundaries so long as other states are not affected. For the purpose of controlling its own affairs Illinois is organized under a form of government very much like that of the United States. There are two legislative bodies which meet at Springfield once in two years to make the laws of the state, levy taxes, and make appropriations for public improvements. The smaller of these bodies is called the Senate or "Upper House." The larger is known as the House of Representatives or "Lower House." The Senate is composed of 51 senators, each elected for four years from a senatorial district. Each district elects three representatives to the Lower House. What legislative district do you live in? Associated with the Governor are other state officers such as the Secretary of State, State Auditor, Treasurer, Attorney General, and Superintendent of Public Instruction. These officers, with many boards, commissioners, and inspectors, appointed by the Governor, have charge of the different departments of state, aiding the Governor in executing the laws made by the legislature and seeing that the state Constitution and the laws are enforced. The judicial department is composed of the Supreme, Circuit, and Appellate courts. These courts explain and apply the laws of the state and thus assist the executive officers in seeing that laws are properly fulfilled by the people. Each county, each township, and each city has its own officers who attend to the public duties in these smaller divisions, much as the state officers do for the state as a whole.

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[1] Most of this material on manufactures is obtained from Bulletin 52, Census of Manufactures, 1905.

APPENDIX

TABLE I. GROWTH OF STATE IN POPULATION

Census Years	Population	Increase	
		Number	Per Cent
1910	5,638,591	817,041	16.9
1900	4,821,550	995,199	26.0
1890	3,826,351	748,480	24.3
1880	3,077,871	537,980	21.1
1870	2,539,891	827,940	48.3
1860	1,722,951	860,481	101.0
1850	851,470	375,287	78.8
1840	476,183	318,738	202.4
1830	157,445	102,283	185.4
1820	55,162	42,880	349.1
1810	12,282		

TABLE II

The following educational bulletins are published by the State Geological Survey. They will be found to be of great value to those living in the regions discussed, also to teachers and students in all parts of the state. This is especially true of Bulletin 15, on account of the importance of the deep waterway to the people of Illinois:

Bulletin 7. *Physical Geography of the Evanston-Waukegan Region*, by Wallace Atwood and James Walter Goldthwaite.

Bulletin 11. *The Physical Features of the Desplaines Valley*, by James Walter Goldthwaite.

Bulletin 12. *Physiography of the St. Louis Area*, by N. M. Fenneman.

Bulletin 13. *The Mississippi Valley between Savanna and Davenport*, by J. Ernest Carman.

Bulletin 15. *Geography of the Middle Illinois Valley*, by Harlan H. Barrows.

Other bulletins to appear soon are:

Physical Geography of the Springfield Quadrangle, by J. C. Jones, and *Physiography of the Wheaton Quadrangle*, by A. C. Trobridge.

These bulletins may be obtained from the Director of the State Geological Survey, Urbana, Ill.

TABLE III. POPULATION OF ILLINOIS TOWNS AND CITIES HAVING MORE THAN ONE THOUSAND INHABITANTS.—THE 1910 CENSUS

COUNTIES

County	1910	1900	1890
Adams	64,588	67,058	61,888
Alexander	22,741	19,384	16,563
Bond	17,075	16,078	14,550
Boone	15,481	15,791	12,203
Brown	10,397	11,557	11,951
Bureau	43,975	41,112	35,014
Calhoun	8,610	8,917	7,652
Carroll	18,035	18,963	18,320
Cass	17,372	17.222	15,963
Champaign	51,829	47,622	42,159
Christian	34,594	32,790	30,531
Clark	23,517	24,033	21,899
Clay	18,661	19,553	16,772
Clinton	22,832	19,824	17,411
Coles	34,517	34,146	30,093
Cook	2,405,233	1,838,735	1,191,922
Crawford	26,281	19,240	17,283
Cumberland	14,281	16,124	15,443
Dekalb	33,457	31,756	27,066
Dewitt	18,906	18,972	17,011
Douglas	19,591	19,097	17,669
Dupage	33,432	28,196	22,551
Edgar	27,336	28,273	26,787
Edwards	10,049	10,345	9,444
Effingham	20,055	20,465	19,358
Fayette	28,075	28,065	23,367
Ford	17,096	18,359	17,035

COUNTIES

County	1910	1900	1890
Franklin	25,943	19,675	17,138
Fulton	49.549	46,201	43,110
Gallatin	14,628	15,836	14,935
Greene	22,363	23,402	23,791
Grundy	24,162	24,136	21,024
Hamilton	18,227	20,197	17,800
Hancock	30,638	32,215	31,907
Hardin	7,015	7,448	7,234
Henderson	9,724	10,836	9,876
Henry	41,736	40,049	33,338
Iroquois	35,543	38,014	35,167
Jackson	35.143	33,871	27,809
Jasper	18,157	20,160	18,188
Jefferson	29,111	28,133	22,590
Jersey	13,954	14,612	14,810
Jo Daviess	22,657	24,533	25,101
Johnson	14.331	15,667	15,013
Kane	91,862	78,792	65,061
Kankakee	40,752	37,154	28,732
Kendall	10,777	11,467	12,106
Knox	46,159	43,612	38,752
Lake	55,058	34,504	24,235
Lasalle	90,132	87,776	80,798
Lawrence	22,661	16,523	14,693
Lee	27,750	29,894	26,187
Livingston	40,465	42,035	38,455
Logan	30,216	28,680	25,489

COUNTIES

County	1910	1900	1890
McDonough	26,887	28,412	27,467
McHenry	32,509	29,759	26,114
McLean	68,008	67,843	63,036
Macon	54,186	44,003	38,083
Macoupin	50,685	42,256	40,380
Madison	89,847	64,694	51,535
Marion	35,094	30,446	24,341
Marshall	15,679	16,370	13,653
Mason	17,377	17,491	16,067
Massac	14,200	13,110	11,313
Menard	12,796	14,336	13,120
Mercer	19,723	20,945	18,545
Monroe	13,508	13,847	12,948
Montgomery	35,311	30,836	30,003
Morgan	34,420	35,006	32,636
Moultrie	14,630	15,224	14,481
Ogle	27,864	29,129	28,710
Peoria	100,255	88,608	70,378
Perry	22,088	19,830	17,529
Platt	16,376	17,706	17,062
Pike	28,622	31,595	31,000
Pope	11,215	13,585	14,016
Pulaski	15,650	14,554	11,355
Putnam	7,561	4,746	4,730
Randolph	29,120	28,001	25,049
Richland	15,970	16,391	15,019
Rock Island	70,404	55,249	41,917
St. Clair	119,870	86,685	66,571
Saline	30,204	21,685	19,342
Sangamon	91,024	71,593	61,195
Schuyler	14,852	16,129	16,013
Scott	10,067	10,455	10,304
Shelby	31,693	32,126	31,191
Stark	10,098	10,186	9,982
Stephenson	36,821	34,933	31,338
Tazewell	34,027	33,221	29,556
Union	21,856	22,610	21,549
Vermilion	77,996	65,635	49,905
Wabash	14,913	12,583	11,866
Warren	23,313	23,163	21,281
Washington	18,759	19,526	19,262
Wayne	25,697	27,626	23,806
White	23,052	25,386	25,005
Whiteside	34,507	34,710	30,854
Will	84,371	74,764	62,007
Williamson	45,098	27,796	22,226
Winnebago	63,153	47,845	39,938
Woodford	20,506	21,822	21,429
The State	5,638,591	4,821,550	3,826,351

CITIES AND TOWNS

Abingdon, Knox	2,464
Albion, Edwards	1,281
Aledo, Mercer	2,144
Altamont, Effingham	1,328
Alton, Madison	17,528
Amboy, Lee	1,749
Anna, Union	2,809
Arcola, Douglas	2,100
Arlington Heights, Cook	1,943
Arthur, Douglas	1,080
Ashland, Cass	1,096
Assumption, Christian	1,918
Astoria, Fulton	1,357
Athens, Menard	1,340
Atlanta, Logan	1,367
Auburn, Sangamon	1,814
Augusta, Hancock	1,146
Aurora, Kane	29,807
Averyville, Peoria	2,668
Barrington, Cook	1,444
Barry, Pike	1,647
Batavia, Kane	4,436
Bates, Sangamon	100
Bath, Mason	475
Beardstown, Cass	6,107
Belleville, St. Clair	21,122
Belvidere, Boone	7,253
Bement, Piatt	1,530
Benld, Macoupin	1,912
Benton, Franklin	2,675
Berwyn. Cook	5,841
Bloomington, McLean	25,768
Blue Island, Cook	8,043
Bradley, Kankakee	1,942
Braidwood, Will	1,958
Breese, Clinton	2,128
Bridgeport, Lawrence	2,703
Brookfield, Cook	2,186
Brooklyn, St. Clair	1,569
Brookport Massac	1,443
Bunker Hill, Macoupin	1,046
Bushnell, McDonough	2,619
Cairo, Alexander	14,548
Cambridge, Henry	1,272
Camp Point, Adams	1,148
Canton, Fulton	10,453
Carbondale, Jackson	5,411
Cardiff, Livingston	1,031
Carlinville, Macoupin	3,616
Carlyle, Clinton	1,982
Carmi, White	2,833
Carpentersville, Kane	1,128
Carriers Mills, Saline	1,558
Carrollton, Greene	2,323
Carterville, Williamson	2,971
Carthage, Hancock	2,373
Casey, Clark	2,157
Central City, Marion	1,179
Centralia, Marion	9,680
Champaign, Champaign	12,421
Charleston, Coles	5,884
Chatsworth, Livingston	1,112
Chenoa, McLean	1,314
Cherry, Bureau	1,048
Chester, Randolph	2,747
Chicago, Cook	2,185,283
Chicago Heights, Cook	14,525
Chillicothe, Peoria	1,851
Chrisman, Edgar	1,193
Christopher, Franklin	1,825
Cicero, Cook	14,557
Clinton, Dewitt	5,165
Clyde, Cook	1,000
Coal City, Grundy	2,667
Colchester, McDonough	1,445
Collinsville, Madison	7,478
Columbia, Monroe	2,076
Crotty, Lasalle	1,005
Crystal Lake, McHenry	1,242
Cuba, Fulton	2,019
Dallas City, Hancock	1,288
Danville, Vermilion	27,871
Decatur, Macon	31,140
Dekalb, Dekalb	8,102
Delavan, Tazewell	1,175
Depue, Bureau	1,339
Des Plaines, Cook	2,348
Divernon, Sangamon	1,519
Dixon, Lee	7,216
Dolton, Cook	1,869
Dorrisville, Saline	1,184
Downers Grove, Dupage	2,601
Dundee, Kane	4,100
Duquoin, Perry	5,454
Dwight, Livingston	2,156
Earlville, Lasalle	1,059
East Dubuque, Jo Daviess	1,253
East Dundee, Kane	1,405
East Moline, Rock Island	2,665
East Peoria, Tazewell	1,493
East Saint Louis, St. Clair	58,547
Edwardsville, Madison	5,014
Effingham, Effingham	3,898
Eldorado, Saline	3,366
Elgin, Kane	25,976
Elmhurst, Dupage	2,360
Elmwood, Peoria	1,390
El Paso, Woodford	1,470
Equality, Gallatin	1,180
Eureka, Woodford	1,525
Evanston, Cook	24,978
Fairbury, Livingston	2,505
Fairfield, Wayne	2,479
Farmer City, Dewitt	1,603
Farmington, Fulton	2,421
Flora, Clay	2,704
Forest Park, Cook	6,594
Fort Sheridan, Lake	1,800
Freeburg, St. Clair	1,397
Freeport, Stephenson	17,567
Fulton, Whiteside	2,174
Galena, Jo Daviess	4,835
Galesburg, Knox	22,089
Galva, Henry	2,498
Geneseo, Henry	3,199
Geneva, Kane	2,451
Genoa, Dekalb	1,257
Georgetown, Vermilion	2,307
Gibson City, Ford	2,086
Gillespie, Macoupin	2,241
Gilman, Iroquois	1,305
Girard, Macoupin	1,891
Glen Carbon, Madison	1,220
Glencoe, Cook	1,899
Glenellyn, Dupage	1,763
Golconda, Pope	1,088
Grafton, Jersey	1,116
Granite City, Madison	9,903
Granville, Putnam	1,391
Grayville, White	1,940
Greenfield, Greene	1,161
Greenup, Cumberland	1,224
Greenville, Bond	3,178
Griggsville, Pike	1,262

Name of county follows name of place.

Grossdale, Cook	1,300
Grosspoint, Cook	1,008
Hamilton, Hancock	1,627
Harrisburg, Saline	5,309
Harvard, McHenry	3,008
Harvey, Cook	7,227
Havana, Mason	3,525
Henry, Marshall	1,687
Herrin, Williamson	6,861
Highland, Madison	2,675
Highland Park, Lake	4,209
Highwood, Lake	1,219
Hillsboro, Montgomery	3,424
Hinsdale, Dupage	2,451
Homer, Champaign	1,086
Hoopestown, Vermilion	4,698
Jacksonville, Morgan	15,326
Jerseyville, Jersey	4,113
Johnston City, Williamson	3,248
Joliet, Will	34,670
Jonesboro, Union	1,169
Kankakee, Kankakee	13,936
Keithsburg, Mercer	1,515
Kewanee, Henry	9,307
Knoxville, Knox	1,818
Lacon, Marshall	1,495
Ladd, Bureau	1,910
Lagrange, Cook	5,282
Lagrange Park, Cook	1,131
La Harpe, Hancock	1,349
Lake Forest, Lake	3,349
Lanark, Carroll	1,175
Lansing, Cook	1,060
Lasalle, Lasalle	11,537
Lawrenceville, Lawrence	3,235
Lebanon, St. Clair	1,907
Lemont, Cook	2,284
Lena, Stephenson	1,168
Leroy, McLean	1,702
Lewistown, Fulton	2,312
Lexington, McLean	1,318
Libertyville, Lake	1,724
Lincoln, Logan	10,892
Litchfield, Montgomery	5,971
Livingston, Madison	1,092
Lockport, Will	2,555
Lovejoy, St. Clair	1,500
Lovington, Moultrie	1,011
Lyons, Cook	1,483
McHenry, McHenry	1,031
McLeansboro, Hamilton	1,796
Madison, Madison	5,046
Manteno, Kankakee	1,229
Macomb, McDonough	5,774
Marengo, McHenry	1,936
Marion, Williamson	7,093
Marissa, St. Clair	2,004
Mark, Putnam	1,025
Maroa, Macon	1,160
Marseilles, Lasalle	3,291
Marshall, Clark	2,569
Martinsville, Clark	1,500
Mascoutah, St Clair	2,081
Mason City, Mason	1,842
Mattoon, Coles	11,456
Maywood, Cook	8,033
Melrose Park, Cook	4,806
Mendota, Lasalle	3,806
Metropolis, Massac	4,655
Milford, Iroquois	1,316
Milstadt, St. Clair	1,140
Minonk, Woodford	2,070
Moline, Rock Island	24,199
Momence, Kankakee	2,201
Monmouth, Warren	9,128
Monticello, Piatt	1,981
Morgan Park, Cook	3,694
Morris, Grundy	4,563
Morrison, Whiteside	2,410
Morrisonville, Christian	1,126
Morton, Tazewell	1,004
Morton Park, Cook	1,000
Mound City, Pulaski	2,837
Mounds, Pulaski	1,686
Mount Carmel, Wabash	6,934
Mount Carroll, Carroll	1,759
Mount Morris, Ogle	1,132
Mount Olive, Macoupin	3,501
Mount Pulaski, Logan	1,511
Mount Sterling, Brown	1,986
Mount Vernon, Jefferson	8,007
Moweaqua, Shelby	1,513
Murphysboro, Jackson	7,485
Naperville, Dupage	3,449
Nashville, Washington	2,135
National Stock Yards, St. Clair	2,700
Nauvoo, Hancock	1,020
Neoga, Cumberland	1,074
New Athens, St. Clair	1,131
New Baden, Clinton	1,372
Newman, Douglas	1,264
Newton, Jasper	2,108
Nokomis, Montgomery	1,872
Normal, McLean	4,024
Norris City, White	1,055
North Alton, Madison	1,200
North Chicago, Lake	3,306
Oakland, Coles	1,159
Oak Park, Cook	19,444
Oblong, Crawford	1,482
Odell, Livingston	1,035
Odin, Marion	1,400
O'Fallon, St. Clair	2,018
Oglesby, Lasalle	3,600
Olney, Richland	5,011
Onarga, Iroquois	1,273
Oregon, Ogle	2,180
Ottawa, Lasalle	9,535
Palatine, Cook	1,144
Palestine, Crawford	1,399
Pana, Christian	6,055
Paris, Edgar	7,664
Park Ridge, Cook	2,009
Pawnee, Sangamon	1,399
Paxton, Ford	2,912
Pekin, Tazewell	9,897
Peoria, Peoria	66,950
Peotone, Will	1,207
Percy, Randolph	1,033
Peru, Lasalle	7,984
Petersburg, Menard	2,587
Pinckneyville, Perry	2,722
Pittsfield, Pike	2,095
Plainfield, Will	1,019
Plano, Kendall	1,627
Polo, Ogle	1,828
Pontiac, Livingston	6,090
Portland, Lasalle	3,194
Princeton, Bureau	4,131
Prophetstown, Whiteside	1,083
Quincy, Adams	36,587
Rantoul, Champaign	1,384
Red Bud, Randolph	1,240
Ridgway, Gallatin	1,054
Riverside, Cook	1,702
Riverton, Sangamon	1,911
Roanoke, Woodford	1,311
Robinson, Crawford	3,863
Rochelle, Ogle	2,732
Rockdale, Will	1,101
Rock Falls, Whiteside	2,657
Rockford, Winnebago	45,401
Rock Island, Rock Island	24,335
Roodhouse, Greene	2,171
Rossville, Vermilion	1,422
Rushville, Schuyler	2,422
Saint Anne, Kankakee	1,065
Saint Charles, Kane	4,046
Saint Elmo, Fayette	1,227
Saint Francisville, Lawrence	1,391
Salem, Marion	2,669
Sandoval, Marion	1,563
Sandwich, Dekalb	2,557
Savanna, Carroll	3,691
Seatonville, Bureau	1,370
Seneca, Lasalle	2,100
Sesser, Franklin	1,292
Shawneetown, Galatin	1,863
Sheffield, Bureau	1,009
Shelbyville, Shelby	3,590
Sheldon, Iroquois	1,143
Silvis, Rock Island	1,163
Sorento, Bond	1,018
South Holland, Cook	1,065
South Wilmington, Grundy	2,403
Sparta, Randolph	3,081
Spaulding, Sangamon	308
Springfield, Sangamon	51,678
Spring Valley, Bureau	7,035
Staunton, Macoupin	5,048
Steger, Will	2,161
Sterling, Whiteside	7,467
Stockton, Jo Daviess	1,096
Stonington, Christian	1,118
Streator, Lasalle	14,253
Sullivan, Moultrie	2,621
Sumner, Lawrence	1,413
Swansea, St. Clair	889
Sycamore, Dekalb	3,926
Taylorville, Christian	5,446
Thayer, Sangamon	1,012
Thornton, Cook	1,030
Toluca, Marshall	2,407
Toulon, Stark	1,208
Tower Hill, Shelby	1,040
Trenton, Clinton	1,694
Troy, Madison	1,447
Tuscola, Douglas	2,453
Upper Alton, Madison	2,918
Urbana, Champaign	8,245
Ursa, Adams	170
Utica, Lasalle	1,342
Vandalia, Fayette	2,974
Venice, Madison	3,718
Vermont, Fulton	1,118
Vienna, Johnson	1,124
Villa Grove, Douglas	1,828
Virden, Macoupin	4,000
Virginia, Cass	1,501
Warren, Jo Daviess	1,331
Warsaw, Hancock	2,254
Washington, Tazewell	1,530
Waterloo, Monroe	2,091
Watseka, Iroquois	2,476
Waukegan, Lake	16,069
Waverly, Morgan	1,538
Wenona, Marshall	1,442
West Chicago, Dupage	2,378
West Dundee, Kane	1,380
West Frankfort, Franklin	2,111
West Hammond, Cook	4,948
Westville, Vermilion	2,607
Wethersfield, Henry	1,593
Wheaton, Dupage	3,423
White Hall, Greene	2,854
Willisville, Perry	1,082
Wilmette, Cook	4,943
Wilmington, Will	1,450
Winchester, Scott	1,639
Winnetka, Cook	3,168
Witt, Montgomery	2,170
Woodstock, McHenry	4,331
Worden, Madison	1,082
Wyoming, Stark	1,506
Zion City, Lake	4,789

Name of county follows name of place.

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